



THE SEAL OF THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY

*Photographed from a cast of the Great Seal
used upon the Diplomas of Graduation*

So many variants of the Institute Seal are current that it seems desirable to put on record the authoritative form

technology review

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THE ADMINISTRATION OF PRESIDENT PRITCHETT

Dr. Pritchett's announcement of his resignation from the office of President of the Massachusetts Institute of Technology is made soon after he has completed five years of service. His administration has been full of striking and significant events in the history of the Institute, which have been recorded in detail in the pages of the REVIEW, and are familiar to its readers. A survey of them at this time must therefore be chiefly a grouping of generally known facts.

Reference may first be made to the material development of the Institute. During the five years ending on September 30 its total property has increased from \$3,339,000 to \$3,699,000. Of this increase of \$360,000, \$169,000 has been invested in new temporary buildings, and \$113,000 in the land in Brookline. During the same period current expenses have increased from \$356,000 to \$482,000,—an increase slightly more rapid than that in the total number of students. Special mention should be made of the bequest of \$50,000 by the late Augustus Lowell, which, with an equal sum previously contributed by him, created a Teachers' Fund of \$100,000. Largely from members of his family have come the gifts which made possible the erection of the building

containing the Lowell Laboratory of Electrical Engineering. From the Arioeh Wentworth estate has come \$100,000, and in 1901 the State Legislature renewed for ten years its annual grant of \$25,000. Mr. Samuel Cabot has given land in Brookline, and contributions have been received toward a fund for the erection of dormitories. In 1901 the alumni completed the sum of \$100,000 for the Walker Memorial Building, and in 1904 raised towards an Income Fund \$210,000, to be paid in five annual instalments. Numerous gifts for the carrying on of work in research have also been made.

The buildings erected during this time have been of a temporary character. Early in 1902 announcement was made that work was soon to be begun on two buildings: one for the Walker Memorial, the other for the Departments of Physics and Electrical Engineering. Owing, however, to the opening of the question of moving the Institute, the one-story building put up in the summer of 1902 was designed to serve merely temporary needs. The same is true of the building called Engineering C, which was built in the summer of 1903, and the gymnasium on Garrison Street, which has just been completed. In 1902 the Institute purchased in Brookline land adjoining that given by Mr. Cabot, the two pieces amounting to eleven or twelve acres. Part of this land is devoted to athletic purposes, and is known as Technology Field. During this period, in spite of the increase of the tuition fee from \$200 to \$250, the Institute has suffered from inadequate financial resources,—a condition of things that has seriously affected the purchase of new equipment and the payment of adequate salaries.

In all that concerns the life and general welfare of the students at the Institute Dr. Pritchett has taken a most earnest and active interest. The ideal which the proposed

Walker Memorial was to embody appealed to him at once, and in his first report to the Corporation, urging that the fund be completed immediately, he said, "There is no other need at this moment which in my mind is so pressing, and it seems to me absolutely necessary to dispose of this question before taking up others which will so soon demand our attention." The hope of giving to the students extended opportunities for social development naturally led to the plan of removal to a site where dormitory life would be possible,—a project which necessitated the postponement of the Walker Memorial. The Tech Union, however, was established as a sort of social centre, and there the "Kommers" and other gatherings have been held. Dr. Pritchett has made considerable study of the conditions under which students live in Boston, and has caused to be appointed a Medical Adviser for them to consult. The students also have the advantage of a free bed, offered by the authorities of the Massachusetts General Hospital. In athletics the President has brought about the substitution of the sports of Field Day for the dangerous cane rush, and at his suggestion the students voted to abolish "inter-collegiate" football. Thanks largely to his efforts, athletics at the Institute is in a healthy state. In order to bring Tech students into touch with the world at large, and to inspire in them a desire for a broad outlook upon life, Dr. Pritchett has established the meetings called "Convocations." At these gatherings of the entire body of students in Huntington Hall short addresses are made by men who typify various phases of American activity. Among the speakers have been President Eliot of Harvard and President Hadley of Yale, Dr. Lyman Abbott, Dr. Booker T. Washington, Rev. Henry Van Dyke, President Lucius Tuttle, Colonel Thomas Wentworth Higginson, Dr. W. S. Rainsford, Major Henry L. Higginson,

Dr. Edward Everett Hale, Mr. Jacob Riis, and the Rt. Rev. Charles H. Brent. Dr. Pritchett himself has frequently addressed the students, welcoming them to the Institute, encouraging high ideals, and discussing with them various phases of student life. The establishment of Tech House as a means whereby students may get an insight into the social and industrial conditions of the poor in large cities is another indication of Dr. Pritchett's aim to give Institute men breadth of view.

The promotion of research work and advanced instruction at the Institute has been constantly sought by President Pritchett, and during his administration much progress has been made in this direction. The most important steps taken have been the establishment of the Research Laboratory of Physical Chemistry and of the Sanitary Laboratory and Sewage Experiment Station. Both of these have been made possible by generous contributions from friends of the Institute. The Laboratory of Physical Chemistry now has a staff of eight Research Associates and Assistants who devote themselves exclusively to research work, and has attracted many graduate students, seven of whom are now working for the degree of Doctor of Philosophy. The Sanitary Research Laboratory also has a staff of salaried research workers engaged in the investigation of sewage. From both laboratories valuable contributions to the sciences to which they are devoted have already been published. In this connection reference should be made to the Eclipse Expedition sent by the Institute to Sumatra in 1901, under the direction of Professor Burton. President Pritchett has sought to develop graduate instruction and research upon the technical side through the establishment of a Graduate School of Engineering Research, and by offering the degree of Doctor of Engineering. Finally, mention

should be made of his encouragement of scholarship and research on the part of the instructing staff of the Institute. Many of its members have pursued advanced studies abroad, and promotions have been made in recognition of scientific accomplishment.

The main educational events of this period are the adoption by the Faculty of an advance of entrance requirements by the addition of a second modern language in 1903 and of physics in 1905, the introduction of additional general studies in the third year, the establishment of a new course in Electro-chemistry in 1900 and of a course for Naval Constructors in 1901, and the substitution by the Executive Committee of the Corporation of an elective course in General Science for the course in General Studies. The main innovation in connection with the administrative organization, made upon the initiative of the President, was the appointment of a Dean to co-operate with the President in matters relating to the general welfare of students. The importance of the office was instantly recognized, and its value not only to the Freshmen, for whose benefit it was especially designed, but also to men of the upper classes, has been great.

During President Pritchett's administration the Faculty has increased in number from fifty-four to seventy-one. The number of resignations has been fifteen, of deaths three, of new appointments nine, of promotions twenty-six. Appointments of heads of departments include Professor Talbot in Chemistry, Professor Duncan and, more recently, Professor Clifford (acting) in Electrical Engineering, Professor Jaggar in Geology, Professor Bigelow in Modern Languages, Professor Tyler in Mathematics, Professor Burton in Mechanical Drawing and Descriptive Geometry, and Professor Wheeler in Military Science.

The most important of President Pritchett's policies are connected with the general questions which he has presented to Corporation, Faculty, and Alumni, and which have been earnestly considered by all three bodies, and also by the public at large. Of these questions three are especially noteworthy,—that of the abolition of the Course in General Studies, that of removal to a suburban site, and that of alliance with Harvard University. All of these matters have been discussed at length in this REVIEW, and the attitude of President Pritchett towards them has been fully presented. A mere mention of them here is therefore sufficient. As is well known, the first of these questions was decided affirmatively by the vote of the Executive Committee in 1904; and the last two were settled by the decree of the Supreme Court made in September, 1905.

Partly from the discussion of these policies and partly from other causes, such as the Tech Reunion, the Rogers Commemoration, the raising of the Technology Fund, and the giving to the Alumni direct representation upon the Corporation,—a measure actively forwarded by the President,—there has been created a keen interest in Institute affairs on the part of Corporation, Alumni, and friends, which may perhaps be considered the most significant and auspicious circumstance of Dr. Pritchett's administration. There has also been developed a lively sense of the separate dignity and influence and yet of the interdependence of the bodies of Corporation, Faculty, and Alumni. The events by which this result has been reached and the controversies attending them need not be repeated here. The end itself is one at which every true friend of the Institute may heartily rejoice.

THE USES OF FOREIGN LANGUAGES

"Don't graduate your men with any less familiarity with Continental languages than in my day. It is constantly growing more necessary."
(*Graduate Massachusetts Institute of Technology, Class '93.*)

The subject of this paper will be considered with special reference, in the order indicated, to the following classes of persons: first, students; second, professional men; and, third, men of leisure.

I.

A student at the Institute of Technology may take a fancy to make some original experiment or investigation, and be asked by his professor, "Do you know what has already been done in this line?" He cannot pretend that he does if he has not consulted the latest foreign publications on the subject. In such a case he is likely to be referred to them, and told to post himself on their contents. In the courses in mining engineering and metallurgy, in electrical engineering, and in biology he will be required to write English translations or abstracts of matter found in French or German books or periodicals. In architecture he will find the French writings more concise and lucid than the English. The professor of architectural design or composition lectures to the students in French. His comments on their work, his criticisms and suggestions, are habitually given to them in that language. It is most important that they understand these promptings of his master spirit. They are as mother's milk to their suckling geniuses. In the library of the department of architecture one sees students reading English books, with much better French books all around them, simply because of their ignorance of French. In the department of chemistry students are called upon to read and translate German texts in the class-room, and to prepare written reports on the bibliography of particular subjects assigned to them. This work is about 75 per

cent. in German, about 10 per cent. in French, and the rest in English. Students of geology are required to recite from German text-books in crystallography and petrography. There is not a course in which the proper preparation of a graduating thesis will not, or may not, require a student to consult French or German works.

A Technology graduate in civil engineering of the class of 1890 writes to Professor Swain:—

It may be well, perhaps, to remind you that my graduation thesis called for considerable use of Darcy's "Écoulement en Tuyaux," and that during my graduate work at the Institute I was using Ruhlmann's "Hydromechanik" and Grashof's "Theorie der Elasticität und Festigkeit" with you, and Fraenkel's "Bakterienkunde" with Professor Sedgwick, and therefore had more use of both languages, perhaps, than falls to the average man before leaving the Institute.

This case is perhaps not so exceptional as the writer seems to think. Another graduate writes:—

. . . The work I took up for my thesis at Tech required me to compare standard works in French, German, and English, and such translations of the former into English as claimed to be exactly given, including mathematical formulæ and their constants, which would have been impossible without a fair working knowledge of both these languages.

I have thus far considered only the work of undergraduates in four-year courses. There is a five-year and a six-year course in architecture, upon which the attendance is increasing. In these courses the use of French in the lecture-room, drawing-room, and reading-room is indispensable; and a study of both French and German may be considered as essential to the breadth and maturity of mind necessary to the profitable pursuit of these higher studies. A student who wishes to pursue the study of mathematics beyond the stage reached by the undergraduate, or beyond calculus, as some of the students in physics and naval architecture have done, will need a knowledge of both French and German. Graduate students in chemistry have to use a German text-book and German books of reference. A student of biology or of political economy will find

a knowledge of German indispensable to the use of an extensive and eminently reliable literature on these subjects.

A graduate in civil engineering (class of '88) writes as follows:—

I have used French and German almost daily in the last ten years, chiefly in the perusal or study of technical literature. Probably over 95 per cent. of my reading has been in German.

II.

One may be an efficient engineer without a knowledge of any modern language. But one cannot be in the front rank of the profession. One should not expect to make a great name in any field of science or technology without the command of either French or German. The Faculty of the Institute does not know, the students themselves cannot know, which students are going to be in the front rank. The Faculty cannot but assume that all are trying to get there. The studies must, therefore, be directed to that end. Referring to the work of students, I mentioned certain uses of modern languages which may be carried into their work as professional men. A few may now be considered as pertaining particularly to their professional work. To keep up with the discoveries in the properties of metals, one must, as in the study of the higher mathematics, read French or German, perhaps both. To keep abreast of the leaders in art, one must know French. I use the word "art" in its broadest sense, to include what is commonly called taste or æsthetics. Even such utilities as dams, aqueducts, trestle bridges, factories, warehouses, etc., need not be altogether devoid of taste. There is almost always more than one material and more than one form suited to a projected structure. Within the limits of a proposed or warrantable cost there is ordinarily room for the exercise of judgment in the choice of material and in its disposition, so as to create an impression of harmony in the work itself and in its relation to its environment and use.

A striking feature in the present life of our people is their growing appreciation of beauty and aversion to ugliness. We are not satis-

fied with taste and beauty in dress and furniture, in studios, art schools, and museums. We want them more and more in our domestic architecture, in our hotels, in our conveyances, in our public buildings and monuments, in our parks, squares, and bridges. The public is beginning to insist upon good taste even at some cost. It is disposed to favor an engineer who distinguishes himself by a faculty for combining beauty with utility. To be such an engineer, one must be something of an artist as well as an engineer. There is a general belief that the most intense artistic life in the world is found in Paris; that, to grow artistic, one should, if one possibly can, live and study in Paris. To do this to any substantial profit, one must know French.

In perhaps most of the schools or departments of civil engineering in the United States there is little or no use made of modern languages, except occasionally in the preparation of a thesis. This is due to the degree to which the artistic side of an engineer's vocation is subordinated to the utilitarian. Practically, all artistic work is left to collaboration by engineers and architects. A student who wants to be able, however, to design and build a bridge like the Pont Alexandre in Paris must study architectural design and composition as well as engineering; and, to do this, he must or should know French.

Translations, be it moreover observed, are not usually published simultaneously with the originals, nor for months or years thereafter. This gives the connoisseur of foreign languages a decided advantage over his less accomplished competitor. Besides, scientific works are quite commonly translated by persons who have no scientific education. They are consequently liable to be marred by errors, which, though from a linguistic standpoint insignificant, may cause a scientific reader much trouble.

The student may not know in advance which of the languages I have mentioned will prove the more useful to him. He chooses his own course at the Institute, but his work, when he graduates, may be determined by conditions over which he will have no control. A graduate in hydraulic engineering may have to accept a position on a railroad, in a bank, or in a merchant's office. Moreover, the rela-

tive advancement of the arts and sciences in different countries is subject to change. One cannot tell from the conditions of to-day what the relative importance of French and German in the various departments of engineering will be ten or twenty years hence. A graduate has told me that his experience led him to send back to the Institute for a complete set of the text-books that he had used as a student, and to review them thoroughly.

The facilities for travel are constantly improving. Each class that graduates from the Institute stands a better chance than the one before it of going abroad or meeting interesting foreigners in our own country. Such occasions for using a foreign language may be few, but the advantage of being able to improve them may be incalculable. Graduates of the Institute write on this point as follows:—

I make almost as little use of French as of a pistol, but, like the latter, when I do need it, I need it badly. (Class '79.)

I obtained my first position because of my knowledge of French and German, and I have recently been offered an important position in Europe on account of my ability to speak the two languages. (Class '96.)

Shortly after leaving the Institute, a book in German on air pumps was loaned me. One of the principles laid down in that book has been of value to me,—of such value, I think, that I would be willing to take the course [in German] for that alone. (Class '88.)

In Central and South America, in China, Africa, and other parts of the world, where people do not commonly speak English, Americans are either kept out of business or forced out, or are outstripped, by Germans and other Europeans, who have mastered the language of the country. Graduates testify very clearly and forcibly to this fact.

I have been constantly thrown among engineers of many different nationalities,—English, Russian, French, German, and Italian. My observation has been that an engineer educated at the Institute can hold his own in competition with any foreign engineer in any technical work. As to languages, he cannot compete. The Russians and Germans, especially, can speak invariably three often four languages, and, as a rule, all foreign engineers speak at least two. (Civil Engineering, Class '91.)

The increasing foreign trade of the United States will necessarily demand a wider knowledge of such studies [modern languages], and not the least of the causes contributing to the decline of British foreign commerce is the fact that the English people are behind their Continental neighbors in general knowledge of languages other than their own. The consular reports fully prove this statement, and the subject is now [1901] being raised in Parliament. (Mechanical Engineering, Class '91.)

The patent laws of the principal countries of Continental Europe require persons taking out patents therein to work their inventions in the territories of such countries within definite periods from the dates of their patents. These periods vary from one year in Belgium to five years in Italy. The period in France is two years, in Germany three. Any patent that is not worked in accordance with these requirements is forfeited. As a consequence, a number of American agencies are established in Paris, Berlin, and other cities of Europe, engaged in manufacturing American goods with French, German, and other foreign labor. These laborers do not, as a class, talk English. To have the intercourse with them that is necessary to their proper management, one must know their language. It is necessary, too, in every American agency abroad to have some one who can interpret and draw up a contract in the language of the country. For an indefinite time to come the Dean of the Institute of Technology may receive applications like the one embodied in the following letter addressed to him under date of April 13, 1905:—

Dear Sir,—We believe we are correct in addressing you for the names of men who may be qualified to fill a position we now have open. We are anxious to have a young man with some sort of an electrical engineering education, who at the same time is thoroughly conversant with the German language. We wish to send this man to Berlin to look after the details of the business that we, as representatives of the Gesellschaft für drahtlose Telegraphie, now have in Berlin.

This will give a good man an opportunity to work into the wireless telegraph business at the place where the best apparatus is being manufactured, and in the course of time he might be able to be one of our wireless engineers in this country.

A thorough speaking, reading, and writing knowledge of the German language is absolutely essential.

The ratio of annual immigration to the annual increase of population of the United States has increased, with numerous and extensive fluctuations, from 32.24 per cent. in 1871, to 58.90 per cent. in 1904,* and the fecundity of foreign-born women is considerably greater than that of native born.†

The foreign-born population of the United States, exclusive of

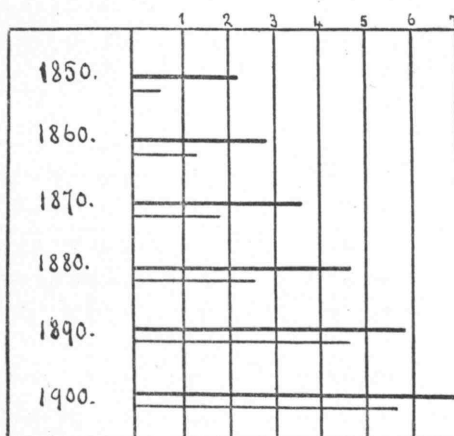


Table I.

— Foreign-born population of the United States, excepting British and Chinese; millions; increase (1850 to 1900) 833 per cent.

— Native-born, British, and Chinese population of the United States; tens of millions; increase (1850 to 1900) 220 per cent.

Compiled and drawn from tables and diagrams in the Twelfth Census of the United States.

China and Great Britain, or consisting of natives of Germany, Norway, Sweden, Denmark, Italy, Russia, Poland, Austria, Bohemia, and Hungary, from 1850 to 1900, together with the mixed remaining population of the United States during the same period, is shown in Table I. This is the best statistical index that I have

* Statistical Abstract of the United States, published by the Department of Commerce and Labor, twenty-seventh number, page 2.

† Bulletin No. 22, Bureau of the Census Department of Commerce and Labor.

been able to procure of the use made, or that might be made, of foreign languages within the United States. With respect to the use of foreign languages by Americans abroad, the data that I have been able to obtain are given in Table II. With special re-

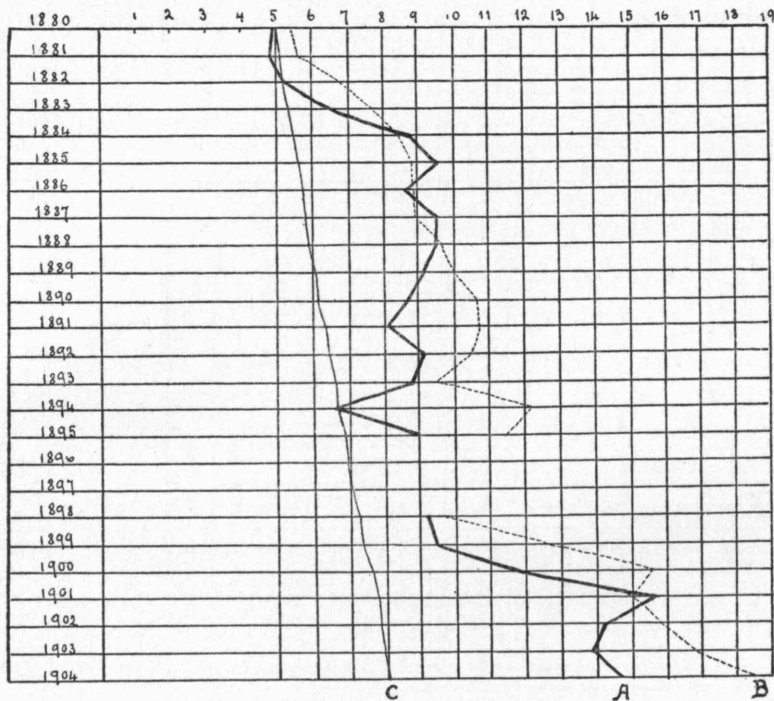


Table II.

- A. United States citizens returning annually from foreign countries; tens of thousands; increase (1880 to 1904) 194 per cent.
- B. Cabin passengers departing annually from seaports of the United States for foreign countries, etc.; tens of thousands; increase (1880 to 1904) 237 per cent.
- C. Population of the United States; tens of millions; increase (1880 to 1904) 63 per cent.

Compiled and drawn from tables in the Statistical Abstract of the United States published by the Department of Commerce and Labor, twenty-seventh number, pages 2, 22, 428, and 430.

spect to their use in commercial intercourse, I compiled Table III., showing the value of the combined exports and imports and the population of the United States, year by year, from 1895 to 1904. Table I. shows the foreign-born population to be gaining on the

remainder: the notable gain since 1880 may be taken to date from the Spanish-American War. Table II. shows that travel abroad is increasing more rapidly than the population. Table III. goes to show that our commercial intercourse with the non-British portion

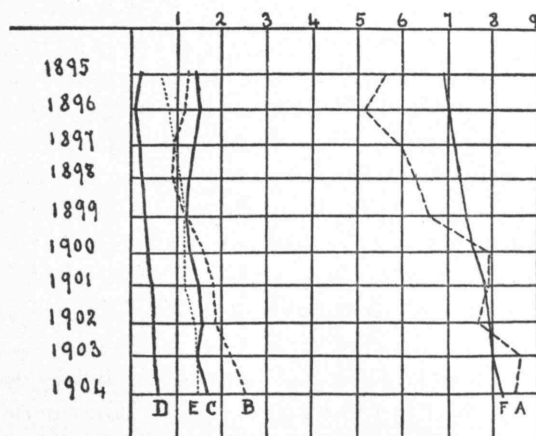


Table III.

Merchandise imported into and exported from the United States by grand divisions of the world, exclusive of English-speaking countries; and population of the United States, 1895 to 1904. Merchandise in hundreds of millions of dollars, population of the United States in tens of millions of persons.

- A. Europe, excluding United Kingdom of Great Britain; increase (1895 to 1904) 51 per cent.
- B. North America, excluding British North America, British West Indies, and Bermuda; including Mexico, other Central American States, Cuba, Porto Rico, and other non-British West Indies; increase (1895 to 1904) 88 per cent.
- C. South America; increase (1895 to 1904) 17 per cent.
- D. Oceania, excluding British Oceania and British Australasia; including Philippine Islands and Hawaii; increase (1895 to 1904) 229 per cent.
- E. Asia, excluding British East Indies; increase (1895 to 1904) 101 per cent.
- F. Population of United States; increase (1895 to 1904) 19 per cent.

Compiled and drawn from tables in the Statistical Abstract of the United States, published by the Department of Commerce and Labor, twenty-seventh number, pages 2, 97 *et seq.*, 642, and 643.

of every great division of the world, with one exception, has in the last ten years increased in greater proportion than our population. The one exception is South America. The disadvantage of South America, as compared with Central America, may be in part due to its greater distance from the United States, but is attributable in no inconsiderable degree to its less torrid climate, and conse-

quently greater European immigration, together with the superiority of the average European to the average American as a linguist. Our expansion to a world power since the Spanish-American War has been accompanied by marvellous changes in our army and navy, in our commerce and in our diplomacy. Is it not to be followed by a corresponding change in our qualifications for intercourse with the people of South America? Can these people believe us to be sincerely interested in their welfare, and not fear our reassertion and modernization of the Monroe doctrine; can we obtain satisfactory results from Pan-American congresses, as long as the youth attending our schools and colleges are commonly given or offered instruction in French and German, and not in Spanish?

It is desirable that Institute graduates appreciate the possible advantage to them of a knowledge of Spanish. There is no other language the importance of which to Americans is increasing so rapidly; and who can doubt that this increase will be accelerated by the construction of the Panama Canal? Graduates write to Professor Swain:—

Business, such as an engineer would likely take up, is reaching out, and the field which is being reached is our new territory, South America, South Africa, etc. Our hardest opposition is German, for in this discussion we need not consider England, as we know the language. Now, to meet this opposition, we must be able to find out what our trade wants, and what our competitor has to sell, his claims for it, and a fair idea of his prices. The best equipped man for this work is the one who can work out his opponents' circulars, and also talk or read the language of his trade. My conclusion would be that a man who can talk Spanish and translate German and French has the best fitting possible for this business. (Class '81.)

I have used Spanish continually since graduation, and my knowledge of it is worth to me about \$50 a month to-day. That is, in this country [Cuba], other things being equal, the engineer who knows Spanish is worth \$50 a month more than the engineer without such knowledge. (Class '99.)

To succeed in a profession, something is necessary besides professional attainments. In all affairs of the world the personal factor has to be reckoned with. Engineers will find it in men under them, in men over them, and in men on a level with them,—in

workmen, or employees; in clients, or employers; and in contractors. They will find it also, when they look for it there, in themselves. Formulæ for atoms and molecules, for heat, light, and electricity, for flow of fluids and strength of materials, will not avail them in the solution of a personal equation. That problem is not reducible to figures or amenable to the operations of arithmetic or algebra. Other things being equal, the man of widest and most varied knowledge, the most accomplished man, the man of the greatest culture, has an advantage over others in making friends and securing business. I do not mean to express approval or disapproval of that form of aid and comfort in the battle of life which is commonly called "pull." But I do say that no one trying to make his way in the world can afford to despise an advantage in personality, to refuse the credential of culture. A graduate whom I met at one of this year's class reunions remarked, in tones of genuine regret, that he had observed a number of cases in which Technology men had lost opportunities of getting positions because of their inability to express themselves in a way to convince a business manager of their abilities. He attributed this defect to the lack at the Institute of dormitories and other arrangements conducive to social intercourse, and the consequently secluded lives that many of the students lead.

The artistic and the manual training of a Technologist conspire to develop in him a reliance upon the eye and hand, accompanied by a corresponding neglect or disuse of the ear and voice. The habit of expressing himself in lines, forms, and colors, in drawings and paintings, in models and other structures, conduces to excessive objectivity, indisposing him to expression without use of the hand or to apprehension without use of the eye. Unless checked or judiciously counteracted, this habit develops into a defect or disability. Its victim finds it hard to keep his thoughts upon a subject without fixing his eyes upon a corresponding object. In the course of the most lucid expositions, the most logical deductions, the most graceful, lifelike descriptions, he will find himself wandering in his thoughts or turning his eyes this way and that in search of a chart, a plan, a drawing, or some other visible form or suggestion

of the speaker's theme. Are not reading and conversation, as practised in a course in modern languages, worthy of consideration as a counteraction to this tendency? To quote again from letters of Institute graduates:—

In the first rounds of an engineer's life his ability to write and speak clear, forceful English may not be of much moment, but the instant that that engineer reaches the point in his career where he must negotiate business with other people, either on his own account or that of people for whom he may be working, his command of English will, to a marked extent, determine the amount of business he can get. (Class '88.)

... The possession of other languages tends to improve a man's command of his own:—

“Wer fremde Sprache nicht kennt
Weiss doch nicht seine eigene.”—*Goethe*. (Class '86.)

... The study of these two languages [French and German] has given me a much better knowledge of English, and hence aided me in giving exactness and accuracy to all written work, has helped me to arrange data, to form conclusions, and make reports, in a more logical manner. It is certain that there is no better method to learn the correct and most economical use of our own language than to study a foreign one. (Class '97.)

How common a thing it is to judge a professional man on personal impressions. Who has not done it? Good reader, have you not yourself some time chosen a dentist or a doctor because he seemed a good fellow, and would not hurt you or let you suffer, without a thought as to his diploma or his standing among men of his profession? I have heard of a middle-aged lady who discharged a physician because he would not hold her hand when he sat by her bed.

III.

Let us now consider the value of foreign languages in the last period of life, or after one has retired from business. I admit that for some men there is no such period, and that for others this period is short, but what I have to say with regard to it will apply to one's leisure at any time of life. I know the industrious habits of Tech-

nology men. I know that they work hard at the Institute and in their professions, but neither as students nor as professional men can they work all the time. I assume that they divide their days on an average into eight hours of work, eight of recreation, and eight of sleep; that they thus spend during their active lives as much, and during their entire lives more, time in recreation than they do in work. What is the average student at the Institute doing about this? Does he know that more careers are spoiled, more lives wrecked, in periods of leisure than in periods of work? Does he realize the value in this regard of true culture, of a taste and faculty for intellectual recreation? I recognize the good there is in outdoor games and sports. During the period of active life physical recreation should, as a rule, have precedence over intellectual. But one cannot employ one's whole leisure in physical recreation. A Technology graduate may be living in the tropics, where he will find the climate a bar to much physical recreation. He may be the only college graduate in a mining or surveying camp in one of our Western States, or in the Sierra Madres or the Rocky Mountains. Such social intercourse as offers itself may be uninteresting or unprofitable, not to say pernicious or demoralizing. He may escape it, he may get away from the thoughts and feelings of the day, and find a pleasant, restful substitute therefor in a book, even in a professional one. But he will be surer to get out of himself, to secure the needed change of thought and feeling, if his reading be a foreign work in a foreign tongue.

In the conduct of education as in the production of art one may work to suit one's self, to realize one's ideals, or to suit the public, to supply a demand. One cannot wisely hold to unalterable ideals with absolute disregard of patronage, nor, on the other hand, have no ideals, and change one's theory and practice with every change of public thought, every fluctuation of public favor. On the question of modern languages the Institute is not merely abreast of the times, it is well ahead of them. The time which it allows to modern languages, including preparation, is nine hours a week for two years. This is as much as could be reasonably expected. But this time is not the maximum that could be profitably devoted to

them: it is the minimum in which a student can be expected to perfect himself in the essential elements of the languages studied. Within a few years the time devoted to the study of modern languages has been diminished. This has been done, however, not by lowering the standard in that study, but by requiring more for admission, by relegating more of the preparation to secondary schools; and the time thus gained has been assigned, for the greater part, to English, the most important of all the culture studies.

Perhaps the best criterion of the usefulness of modern languages to an engineer would be the estimate formed by it of a considerable number of practising engineers. About four years ago Professor Swain addressed to all living graduates in the courses in civil and mechanical engineering a copy of the following letter:—

My dear Mr.—, I shall be very much obliged to you if you will, for my own information, give me an immediate answer to the following questions, as I am desirous of forming an opinion as to the value to our graduates of the instruction which they receive in French and German.

1. To what extent in your professional work since leaving the Institute have you had occasion to make use of French or German?

2. Have you found your command of those languages sufficient for your purpose?

3. Please give your general opinion as to the value to you, either in a professional or an unprofessional way, of the instruction which you received in those subjects at the Institute.

4. Do you think the time devoted at the Institute to these subjects could have been expended in a more profitable manner?

5. Would you be in favor of making these subjects optional for students in your course?

Answers were received from every class to that of 1900, inclusive. These answers, speaking for thirty-three classes and 772 members, have been placed by Professor Swain at my disposal. I present a few extracts therefrom, giving such as are, on the whole, favorable to the study of modern languages and such as are not, in alternation with each other:—

I think that practically all the best, all the most advanced work in the theory of structures is being done in German countries, and that it is most

desirable, if not necessary, for any one who would keep up in this subject to read the German literature as it appears. (Class '89.)

English and American engineering have progressed so rapidly within late years that it is my opinion that an American can find almost any subject equally, if not more, thoroughly covered in his native language than he will in either French or German. (Class '90.)

In my professional work relating to water supply and sewage purification I have had to refer continually to French and German publications. (Class '83.)

French and German are about as serviceable to me as a pair of ice skates would be to a native resident of Borneo. (Class '92.)

I have had many occasions to use German and French in my professional work, especially in investigations of foreign mills and machinery, and also in reading foreign text-books. . . . I would favor German first, French second, Spanish third. . . . I feel very strongly that the studies named in the fourth answer (German, French, Spanish) should be given in each of the engineering courses, and for a successful man, who expects to get profitably through life, I would much rather omit the Calculus even than any of the above. (Class '68.)

I think that the time that I devoted to the study of these two languages [French and German] at the Institute could have been spent in a much more profitable manner. It could have been more profitably spent in sleep. (Class '90.)

. . . in the West, where I have lived practically ever since graduation, the larger part of our best mechanics are Germans, and, although many of them are born in this country, they use their own language among themselves, and, unless you can talk German, it's a waste of time trying to do much business with them, and it's useless trying to handle a force of German workmen unless you understand what they are saying and can talk back. (Class '74.)

. . . I live in a town where four-fifths of the population are German, and do not consider that a knowledge of German even under these circumstances would be of any benefit to me from a professional, business, or social standpoint. (Class '81.)

I have found little or practically no use for French or German in my work. I might have said the same thing of chemistry, calculus, descriptive geometry, and various other subjects, of unquestioned importance. I do not think any one should be permitted to graduate from the Institute who has not a good general knowledge of languages, literature, history, etc., whether he may ever need it to get his living or not. (Class '90.)

To form a satisfactory estimate of the *pros* and *cons* presented by these letters, it is necessary to consider them collectively in a form that will admit of at least numerical comparison:—

<i>Questions.</i>	<i>Answers.</i>
1. To what extent in your professional work since leaving the Institute have you had occasion to make use of French or German?	Much 109 Little 215 None 314 <hr/> Total 638
2. Have you found your command of those languages sufficient for your purpose?	Yes 191 No 198 <hr/> Total 389
3. Please give me your general opinion as to the value to you, either in a professional or in an unprofessional way, of the instruction which you have received in these subjects at the Institute.	Favorable . . . 363 Unfavorable . . 127 <hr/> Total 490
4. Do you think the time devoted at the Institute to these subjects could have been expended in a more profitable manner?	Yes 183 No 321 <hr/> Total 504
5. Would you be in favor of making these subjects optional for students in civil engineering?	Yes 154 No 380 <hr/> Total 534
6. Which language, French or German, have you had the more use for?	French 39 German 49 <hr/> Total 88
7. Which have you made the more use of in scientific reading and business correspondence?	French 22 German 25 <hr/> Total 47
8. Which do you consider the more useful to the average American engineer?	French 5 German 24 <hr/> Total 29
9. Which were you the more proficient in when you graduated from the Institute?	French 69 German 4 <hr/> Total 73

Some of the answers were not sufficiently clear and positive for tabulation. The questions were not all understood. These figures therefore, are not to be taken exactly, or as bases for fine calculations. Considering them, however, as rough approximations, they seem to point to the following conclusions:—

1. About three-quarters of the graduates make little or no professional use of either French or German.

2. Of those who make use of either language, professionally or unprofessionally, about half find their command of the language sufficient, and about half find it insufficient, for their purposes.

3. About two-thirds of the graduates are favorably impressed with the instruction in French and German imparted at the Institute, do not think that the time given to receiving such instruction could be better expended, and are opposed to making the study of these languages optional.

4. Somewhat more than half of the graduates find German a more useful language than French.*

5. With very few exceptions the graduates are more proficient in French than in German.

As a corollary, it may be added that about one-third of those who expressly approve of the instruction in French and German have themselves had little or no professional use for these languages. They thus signally attest their appreciation of language study as an element of general culture.

From a dollar-and-cents point of view neither French nor German has been of the slightest value to me, but I should be heartily ashamed of myself if both of these languages had not formed a part of my education. (Class '88.)

The experiences and observations of graduates seem to warrant the belief that an increasing number of them find the two most useful foreign languages to be German and Spanish, the former for reading and the latter for speaking.

It goes without saying that for speaking purposes any language

* In Bulgaria, Servia, Roumania, Turkey, and Russia, German is now more widely used than French, which once held the first rank. (Class '94.)

may be the most important. Under these conditions it would seem wise to consider the practicability of making a change in the programme of studies in modern languages at the Institute. Instead of requiring all students to take French and German, to require them to take two languages, one of which shall be prescribed and the other elective. Thus students of architecture and naval architecture might be required to take French and one other modern language, and other students, German and one other modern language.

The principal uses of foreign languages at the Institute and in a graduate's after-life may be stated in order of importance as follows: 1. Reading; 2. Writing; 3. Speaking; 4. Culture.

A graduate should, on leaving the Institute, be able to read a French scientific book with the aid of a French technical dictionary; and a French newspaper, or ordinary French, with occasional references to a French lexicon, but without the use, in either case, of a French and English dictionary. He should be correspondingly proficient in the reading of German, and of Spanish, if he has taken that language.

He should be able to write, in each of the foreign languages that he has studied, a letter, contract, or other paper which an educated foreigner would readily understand; to write effectively through the medium of a foreign amanuensis.

He should be able to talk these foreign languages intelligibly and with a tolerable accent.

In the courses at the Institute English is avoided, and a foreign language used as much as possible. Reading aloud in English is being gradually abandoned. When English has to be used, it is to be done in writing.

The course in French commences with a drill in the elementary sounds of the language, which are displayed on large charts in each of the French section rooms.

Students are marked on pronunciation separately from grammar, etc. Record marks are means between marks for pronunciation and marks for other work. Marks for pronunciation are determined by the following scale, based upon the one in general use at the In-

stitute.* The term "audible" means that can be heard and recognized as the language used at a distance of about twenty feet; and the term "tolerable," that can be listened to without pain by one who knows the language.

C	Audible, intelligible, tolerable, fluent, expressive.	
P÷	Audible, intelligible, tolerable, fluent.	Inexpressive.
P	Audible, intelligible, tolerable.	Halting.
L	Audible, intelligible.	Intolerable.
F	Audible.	Unintelligible.
FF		Inaudible.

Conversation is taught not only for its possible usefulness in itself, but also as a means to the comprehension and appreciation of the written language, as a factor in fixing the language in the student's memory, and as an element of culture. It forms a part of every language course, and commences at the first lesson. The course in conversation as a separate subject is abolished. Most of the conversation between the pupils and instructors is in the language taught. Instructors at their weekly meetings, and in their intercourse with one another in the rooms of the department, habitually talk a foreign language.

In technical or scientific reading every effort is made to have the students understand the technology or science that they are reading about.†

In the translation of measures foreign terms are converted into American: meters into yards; kilometers, leagues, and German miles into statute miles; kilogrammes into pounds; marks, francs, and centimes into dollars and cents; degrees Centigrade into degrees Fahrenheit, and *vice versa*.

From the foundation of the Institute general, or culture, studies have formed part of its curriculum. As the Institute developed and the needs and wants of its alumni came to be better known, the num-

* C (passed with credit), P (passed), L (passed with low standing), F (failed to pass), FF (failed completely).

† I think students object to reading fables and trash. What they want is a scientific education, and all compulsory reading should lead to that end, and professors should be qualified to teach science along with language. (Graduate Massachusetts Institute of Technology, Class of '90.)

ber and variety of such studies was increased. To-day there is no other technical school in the country at which so much that is not technical is required of its students. In one sense, and a very proper one, all studies minister to culture, but those to which I refer as culture studies in the Institute courses are the following:—

History of the United States, History of Europe since 1815, Business Law, Political Economy, English Literature, and Composition, French and German, and the third-year options not named in this list.*

How much culture can be derived from these studies depends, needless to say, upon the attitude of the student towards them, the spirit in which they are taken up and pursued. The majority of the students do not profit from them as much as they might, because they are not interested in them, they do not appreciate their importance.

What is needed for the development of the culture side, so to speak, of the Institute, is not an increase in the courses, nor in the time allowed them, so much as a stimulation, an awakening, of the culture spirit among the students. That subject I will not enter upon here, except to remark that the practice inaugurated by President Pritchett, of having occasional convocations of students and instructors at which they are addressed by men of commanding ability and attainment on interesting topics of the day, is a potent influence in the direction indicated. However the students may apply themselves, the culture that they acquire from the studies named is little enough; and yet who will say that the high standing of the Massachusetts Institute of Technology among technical schools is not largely due to the advantage possessed by its graduates in their general knowledge, or culture?

I very much doubt [says a graduate] whether my knowledge of French and German has aided my progress in a professional way to the slightest degree, or whether it has ever enabled me to make a better design or a more complete investigation, or added a dollar to my income, but at the same time I value the feeling of satisfaction that has come from

* These optional studies are all non-professional. Every regular student is required to take one for one year.

possessing these incomplete accomplishments. It must be remembered that one hour spent on a modern language does not take one hour away from opportunity to study engineering. Change brings rest, and the way that I have found it possible to average so many hours per day and per year of hard work has been by carefully planning my daily tasks so as to bring change of course of thought at intervals of each few hours. (Class '76.)

The culture studies make a small showing in a student's Tabular View, but, if he estimate their value rightly, he will apply himself to them with all the more earnestness, with an ardor inversely proportional to the time that he is permitted to devote to them.

JOHN BIGELOW, JR.

SOME ASPECTS OF ALUMNI REPRESENTATION

The recent action of the Corporation of the Institute inaugurating a system of alumni representation marks an epoch in our history. It is opportune for the alumni who are to exercise by their franchise an important influence on the future of the school to review their past relations to it, and to consider certain aspects of its organization and administration.

The Alumni Association was organized in 1876, "to further the well-being of the Institute and its graduates by increasing the interest of members in the school and in each other." With some degree of self-confidence this was declared to be "the final step in the plan of the founder of the Institute." Addressing Professor Richards as President of the Association, President Rogers said: "I hail with pleasure the organization of the society of which you have been chosen President, believing that it cannot fail to promote the educational and scientific objects for which the Institute was established." Two years later it was voted "that a permanent Committee on the School be appointed from the alumni, whose duty shall be to keep itself informed as to the courses of instruction, management, and policy of the School, and to render a report of the same at each annual meeting." The same year (1878) the Corporation, through the Executive Committee of the Association, invited a nomination for election to the Corporation. Mr. Howard A. Carson, '69, was nominated and duly elected, becoming also a member of the important Corporation Committee on the School.

In 1885 the Association undertook to establish a scholarship of not less than \$5,000 in memory of President Rogers. Within ten years this fund reached \$10,000. The successful effort to secure a fund of \$100,000 for a Walker Memorial is recent history, and the important collateral activity of alumni agencies: the Technology Club, the Association of Class Secretaries, the TECHNOLOGY REVIEW, the Advisory Council on Athletics, the outside local societies, need only be mentioned.

Reviewing the activities of the Alumni Association, it appears that, while both Corporation and alumni have worked for a common end, their relations with each other have not been especially close, and that the privilege of nomination extended to the few alumni of 1878 was not deemed a precedent to be systematically followed. Nor has the number of alumni elected to Corporation membership through the ordinary channels been notably large. Of the forty-four life members of the present Corporation,—not including the three representatives of the Commonwealth,—eight are Institute graduates, four others are former students. Of the seven members of the Executive Committee, one has always been an alumnus.

Some of the causes of these conditions are not far to seek. The Massachusetts Institute of Technology is the product of somewhat remarkable conditions. It is a State institution, yet the State contributes but a small fraction to its support. Unlike most other educational foundations of similar size, it cannot claim priority of interest either as the oldest institution of higher learning in its region or as the representative of the cultural needs and ideals of a particular sect or class. Nor did it originate in any superabundance of riches seeking a useful outlet.

There was a great public need of a new kind of education, a need imperfectly met by any existing agencies. There was a man of inspired genius who undertook to meet that need. He satisfied himself and others that this could be fully accomplished only by the establishment of a new and independent school. The great problem of financial support remained to be worked out. It has been worked out,—gradually and sometimes even painfully,—as the remarkable development of the school has so abundantly vindicated his foresight and judgment. Until long after President Rogers's death the Corporation consisted largely of men who had shared or directly inherited the enthusiasm and the ideals of the founder and his associates,—such men as Cummings, Endicott, Lowell, and Forbes. Between their passing and the possible accession of alumni equal to so great responsibilities, a period of transition must intervene,—a period in which the choice of members of the Corporation would be relatively difficult. We are nearing the end of this transition

period, and the recent action of the Corporation is a recognition that the sons of the Massachusetts Institute of Technology have, as a body, come of age, that they are henceforth entitled to a share in the family councils.

A transition, to be real progress, must be gradual. Wise conservatism and, still more, continuity of policy are essential to the welfare of an institution which invites and depends on public confidence. The adoption by the Corporation of a comprehensive plan for alumni representation, while obviously an expression of general confidence of the Corporation in the alumni, has been preceded by a prolonged period of storm and stress. The first, and not the least, service which alumni representatives can render is to prove in their own persons that the alumni seek only the welfare of the school, and that they are anxious to co-operate most heartily with all those—in the Corporation or not—who desire its independent development along the broad lines in which its past and present success has been accomplished.

What, then, are the tasks and the responsibilities awaiting the men who will have the honorable distinction of election to the Corporation as alumni representatives? In answering such a question, it is an easy and tempting error to outline a programme of real or apparent improvements hopelessly beyond the possibility of present accomplishment. For efficiency of development it is essential to avoid alike the unprogressive acceptance of present conditions as the best possible, and the fruitless dissipation of energy involved in making a simultaneous advance with inadequate resources along the whole line. Before progress can be made in any direction, it is also indispensable to gain a clear and complete understanding of present conditions. What, then, is the Institute of Technology to-day, what are in particular its principles of organization, its needs, and its resources?

The organization and administration of an educational institution must be determined with reference to the accomplishment of certain purposes, the realization of certain ideals. They are means, and only means, to this end. The best organization will be as simple as possible, and will have such flexibility as to adapt itself to changing conditions.

It would go beyond the limits of the present paper to attempt a restatement of the characteristic ideals of the Institute of Technology. Originating with President Rogers, they have been gradually but surely worked out by his associates and successors. Always achievement has led to a new advance of the ideal, continually approached, but never reached. To-day we may say that the general purpose of the Institute of Technology is to include in its domain the broadest and highest education in science, with special but not exclusive reference to its useful applications, and to include also whatever else can now be considered essential for the liberal education of men entering the scientific professions.

The Institute must then be so organized and administered not only that it shall here and now turn out the best educated graduates, but so also that it shall steadily and surely develop as a living organism into its highest future as a scientific university. The speed of this progress in the development of a permanent institution is of small importance in comparison with its certainty of direction.

Any system of organization must recognize that the Institute's primary work is teaching. This requires a well-selected and well-organized body of teachers, working under favorable conditions. With this must be judiciously combined attention to the physical and social education of students and the increasing development of scientific investigation. All of these involve expense with no apparent limit. Provision is thus necessary for the appointment and organization of a Faculty and instructing staff, for land, buildings, and equipment, and for attracting public and private financial support. Some of the activities involved are purely educational, some are purely financial, many combine both elements. It is vitally important that there should be a wise distribution of responsibility for these activities among Corporation, Faculty, and administrative officers. That the Corporation should have control and responsibility in legal and financial matters, and that educational questions will often be determined thereby, will be generally agreed. That questions of educational policy should be settled by the Faculty subject only to financial limitations—a considerable qualification—may be maintained with equal confidence. A Faculty

which does not merit this responsibility has been unwisely selected or has been permitted to deteriorate, and should be improved by appointments or removals. A Faculty that is denied a responsibility of which it is worthy suffers discredit, with consequent harm to the institution.

In the countless questions which are both educational and financial, and thus concern both the Faculty and the Corporation, adequate provision for some form of conference and exchange of views is much to be desired. With small institutions the active trustees, together with the President, may be well acquainted with the needs and conditions of all professors, or at any rate of all departments. With increased size and complexity this becomes increasingly difficult. There are obvious objections to dependence on more or less accidental contact between individual members of the two bodies, and the natural remedy would appear to lie in the constitution of a joint committee of Corporation and Faculty, or in formal provision for the presentation of Faculty matters to the Corporation by specially delegated committees. A good mutual understanding between Corporation and Faculty will naturally be facilitated by the presence of alumni in the former body.

It is an important and difficult task of the Corporation to appoint new teachers, and, as time passes, to provide, so far as needful, for the retirement of the old. In a large institution, efficiency of instruction depends greatly on co-operation and unity of purpose in the instructing staff,—on good “team work.” Whatever the advantages for advertisement of “all-star” casts on the stage, systematically concerted effort is indispensable for successful technological education. The participation of men, however eminent or able, is only a doubtful auxiliary unless and until they become closely and sympathetically associated with the Faculty of the institution. The efficiency of that body for teaching purposes is more than proportional to the number and the individual skill of its members. Just as the primary function of the Institute is teaching, so the primary qualification for valuable service in its Faculty is interest in and aptitude for teaching. The necessity of high character and attainments and the importance of scientific promise and practical

experience need not here be emphasized. The man thus qualified will be attracted to the Institute staff not mainly by present or possible financial rewards, but by the opportunities for congenial intellectual activity, for shaping the development of successive classes of students, for association with scientific men, and for a responsible share in the educational evolution of the school. A fair financial return is essential, in order to keep the profession open to men without means, and in order to maintain some degree of esteem on the part of a public addicted to the use of the dollars-and-cents scale; but the professor is rarely willing to be a seeker of wealth. He needs equipment, responsibility, and freedom; and the greatest of these is freedom,—freedom to teach the truth as he sees it, freedom individually from such excessive pressure as shall paralyze productivity, freedom collectively to shape and direct the educational policy of the school toward the accomplishment of its ideals, which he must have made his own. If these are denied or restricted, his enthusiasm and joy in his calling will gradually decline, and his power for good will be diminished. The accession of strong men will be hindered or prevented by the preference of the best men for institutions or callings offering greater freedom.

The Faculty of the institution is the body charged with the responsibility of its primary function,—instruction; but it is much more. As a body, it has the clearest conceptions of the ideals of the institution; that is, of that which makes it something more than a mere educational mill. It has received these ideals from its predecessors, it must hand them down advanced towards perfection. Unlike the trustees or the alumni, it devotes continuous attention to the work and welfare of the school. If its members have been wisely selected, they will steer a mean course between complacent conservatism and restless innovation. They will cultivate close relations with the graduates as the surest means of preserving due adaptation of their work to the present and the anticipated developments of professional practice, not forgetting, on the one hand, the possible advantage of reversing the relation of teachers and taught, on the other hand the permanence of the great scientific principles underlying changing applications.

It is the province of the Faculty and its members not merely to give instruction, not merely to keep in touch with professional progress: they must prosecute and direct scientific investigation. They must also supervise in some measure the physical and social education of the students. All these are indispensable to the maximum efficiency of education. Taken together, they constitute the educational policy of the school.

The physical and social welfare of students and the development of their *esprit de corps* have received increasing attention in recent years, as the orderly progressive development of a weaker member of the organism. The development, like any other, has its due limits, and the pendulum should not be permitted to swing too far. Much has yet to be accomplished for physical welfare with the inauguration of the Walker Memorial, so admirably supplemented by Mr. Cilley's munificent bequest. It would be a poor service to the institution to permit such an over-development of athletic or social diversions as should impair our high standards of work in fundamental subjects.

The importance and value of the development of scientific investigation can scarcely be overestimated. It is an essential and large part of our ideal programme, without which the highest standards of teaching itself will not be attained. Here, again, our progress has been consistent and continuous. With increasing resources and increased release of highly trained teachers from excess of undergraduate instruction, progress in this direction will be steadily maintained.

Departmental organization needs also to keep pace with development in other lines. Our present organization involves concentration of general responsibility and authority in the hands of the President and the Executive Committee of the Corporation, concentration of departmental responsibility and authority in the hands of an appointed head. Such centralization conduces to immediate efficiency, but sustained vigor demands a high degree of individual initiative and free discussion among all members of the Faculty or the departmental staff. The organization of separate departmental faculties would doubtless involve disadvantageous detachment, but

departmental conferences for discussion of matters of common interest are of value in counteracting any tendency to excessive concentration.

The Institute's material needs are many and urgent. It needs a great sum for the immediate purchase of a tract of land essential for its future development. Its buildings have long been overcrowded, and several of them must soon be replaced. Its equipment can be kept up to date only at heavy cost. Its salaries, long since declared to be "cruelly inadequate," have not advanced in proportion to the increased cost of living. It has much to do in the development of new work and in improving conditions of student life. The alumni representatives now to be elected will realize that the problem confronting them is by no means a merely financial one, that any successful effort to secure the necessary financial support, to say nothing of the wise and economical use of whatever is secured, must rest on a careful study of fundamental principles and conditions, some of which have been outlined in this paper. The Institute needs the harmonious co-operation of all its constituencies in the steady working out and the gradual perfecting of its educational programme. In this co-operation the share of the alumni representatives may well be both momentous and honorable.

H. W. TYLER, '84.

ANNUAL MEETING OF THE ALUMNI ASSOCIATION OF THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY

BUSINESS MEETING

The annual meeting of the Alumni Association was held at Hotel Brunswick, Friday, December 29, at 5.30 P.M., President Locke in the chair.

Giles Taintor, Esq., of the class of '87, read a communication offering his services as counsel to the Alumni Association free of all expense to the Association. On motion of Professor Richards this courtesy was accepted by the Association.

The proposed changes in the Constitution, mailed to members of the Association on December 15, were, with verbal amendments, unanimously adopted.

The following is the text of the Constitution, including these changes:—

CONSTITUTION

ARTICLE I.

This Society shall be called the Alumni Association of the Massachusetts Institute of Technology. Its object shall be to further the well-being of the Institute by increasing the interest of members in the School and in each other.

ARTICLE II.

MEMBERSHIP

SECTION 1. The members of this Association may be regular, associate, or honorary.

SECT. 2. All graduates of the Institute shall be regular members.

SECT. 3. Any other member of a class which has graduated may become an associate member on election by the Executive Committee. Applications for associate membership shall be submitted in writing through the Secretary of the Association to a Membership Committee of seven, which shall meet at least twice a year, and names of persons recommended by the committee for

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associate membership shall be reported to the Executive Committee, and the names of those elected by the Executive Committee shall be announced by the Secretary in connection with the call for the next ensuing meeting of the Association.

SECT. 4. Any other person, a present or former member of the Corporation or of the Faculty of the Institute, may be elected an honorary member by the Executive Committee of the Association.

SECT. 5. Associate members and honorary members shall be entitled to all the privileges of regular members, except those of voting and holding office.

SECT. 6. Only members of the Alumni Association who have not been connected with the Institute as students for at least five years shall be entitled to vote for term members of the Corporation.

ARTICLE III.

The officers of the Association shall be as follows: There shall be a President, two Vice-Presidents, and a Secretary, who, with four other members, shall constitute an Executive Committee. There shall be a Nominating Committee of six members, no one of whom shall be eligible for immediate re-election. The President and Secretary shall be elected for one year, the Vice-Presidents and members at large of the Executive Committee and the members of the Nominating Committee for two years. One Vice-President, two members at large of the Executive Committee, and three members of the Nominating Committee shall be elected annually. There shall also be such standing committees as may be designated by the Association.

ARTICLE IV.

The duties of the President, Vice-Presidents, and Secretary, shall be those commonly pertaining to their offices, and the Secretary shall, in addition, perform the duties of the Treasurer. The Executive Committee shall look to the general interests of the Association, and shall have power to fill all vacancies arising among its officers. The duties of the Nominating Committee shall be to present, through the Secretary, nominations for all offices to be filled and nominations for election to the Corporation.

ARTICLE V.

SECTION I. The officers of the Association and candidates for election to the Corporation shall be chosen by letter ballot.

SECT. 2. Prior to October 20 the Nominating Committee shall transmit to the Secretary nominations for the offices to be filled and nominations for election to the Corporation. The nominations for election to the Corporation shall be at least five more in number than the places to be filled. The Secretary shall publish the nominations transmitted by the Nominating Committee in at least one daily paper in the city of Boston before October 25. Additional nominations for any office or for election to the Corporation, signed by at least thirty members of the Association entitled to vote for such nominees, shall be placed on the official ballot by the Secretary if received by him before November 15.

SECT. 3. Prior to November 20, letter ballots containing the names of all candidates shall be sent by the Secretary to all members of the Association entitled to vote as specified in Article II. In order to be counted, a ballot must be returned to the Secretary, enclosed in an envelope, indorsed with the voter's signature and class. The polls shall close December 20, and the Executive Committee shall thereupon canvass all ballots and announce the result. The candidates receiving the largest number of votes shall be deemed elected. Should there be a failure to elect on account of a tie, the tie shall be resolved by lot drawn by the Secretary.

SECT. 4. At least thirty days before the March meeting of the Corporation the Secretary shall send to the Nominating Committee of the Corporation the names of the candidates receiving the largest number of votes for election to the Corporation, in number two more than the number of vacancies.

SECT. 5. If any vacancy occurs among the term members of the Corporation through death, resignation, or otherwise, the Alumni Association shall choose for each vacancy two candidates in addition to those chosen according to the provisions of Section 3 of this article.

SECT. 6. The election of officers in the year 1905 shall be by ballot at the annual meeting. Three members of the Nominating Committee shall be elected for two years, and three members for one year. Prior to January 16, 1906, this Nominating Committee shall transmit to the Secretary eighteen nominations for election to the Corporation. Prior to January 22, letter ballots containing the names of all candidates shall be sent by the Secretary to all members of the Association entitled to vote as specified in Article II. In order to be counted, a ballot must be returned to the Secretary, enclosed in an envelope indorsed with the voter's signature and class. The polls shall close on Feb. 14, 1906, and the Executive Committee shall thereupon canvass all ballots and announce the result. Prior to February 17

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the Secretary shall send to the Nominating Committee of the Corporation the names of the fourteen candidates receiving the largest number of votes. Should there be a failure to elect on account of a tie, the tie shall be resolved by lot drawn by the Secretary.

ARTICLE VI.

Every regular and associate member shall pay to the Treasurer the sum of one dollar annually, to defray contingent expenses. The payment of twenty dollars at one time shall constitute Life Membership.

ARTICLE VII.

The regular annual meetings of this Association shall be held in December or January of each year. In addition to these, special meetings may be called at any time by the Executive Committee, and shall be so called at the request, in writing, of ten members.

ARTICLE VIII.

This Constitution may be amended at any time by letter ballot. Proposed amendments, indorsed by the Executive Committee or by fifty members of the Association, shall be sent by the Secretary to all members of the Association, with notice of the time of closing the polls, which shall not be less than thirty days from the date upon which the proposed amendment is sent out. In order to be counted, a vote for or against the proposed amendment must be returned to the Secretary, enclosed in an envelope indorsed with the voter's signature and class. The Executive Committee shall thereupon canvass all ballots and announce the result. A proposed amendment receiving less than two-thirds of the total votes cast, or less than two hundred votes, shall be lost.

The printed report for 1905 was adopted.

Reports were received and placed on file, as follows: The Executive Committee; the Trustees of the Alumni Fund and of the Life Membership Fund; the Financial Report of the Secretary; the Committee on the School; the Committee on the William Barton Rogers Scholarship Fund; the Advisory Committee on Athletics.

The Secretary was authorized to print the Report of the Walker Memorial Committee, which was not presented at the meeting, owing to the absence of the chairman.

The Nominating Committee submitted the following names on a printed ballot: Everett Morss, '85, president; James B. Stanwood, '75, vice-president; Arthur G. Robbins, '86, secretary; Joseph H. Knight, '96, and James W. Rollins, Jr., '78, members of the Executive Committee; Joseph P. Gray, '77, member of Alumni Committee on the School; Walter Jenney, '77, and Henry P. Talbot, '85, members of Committee on Associate Membership; Frank H. Briggs, '81, member of Advisory Committee on Athletics.

The Secretary was authorized to cast one ballot for the officers named, all of whom were elected.

At the request of the Executive Committee the Nominating Committee submitted the following list of nominations for a Nominating Committee under Section 6 of Art. V. of the by-laws: Robert H. Richards ('68), Howard A. Carson ('69), Samuel E. Tinkham ('73), Francis H. Williams ('73), John R. Freeman ('76), Richard A. Hale ('77), James P. Munroe ('82), William B. Thurber ('89), Walter E. Piper ('94), J. Arnold Rockwell ('96).

From this list the Association elected by ballot three members of the Nominating Committee to serve for two years and three members to serve for one year.

The President appointed Giles Taintor and Frank W. Hodgdon tellers to distribute, receive, and count the ballots. The tellers reported that 96 ballots were cast.

Robert H. Richards	received	90	votes.
Howard A. Carson	"	84	"
James P. Munroe	"	77	"

And they were declared elected to serve for two years.

Francis H. Williams	received	73	votes.
Samuel E. Tinkham	"	70	"
J. Arnold Rockwell	"	54	"

And they were declared elected to serve one year.

The Secretary was authorized to print and mail to members the proceedings of the meeting.

ARTHUR G. ROBBINS, '86, *Secretary*.

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REPORT OF THE EXECUTIVE COMMITTEE

The Executive Committee during the past year has held twelve regular meetings in addition to numerous conferences and sub-committee meetings.

The committee joined with representatives of the Association of Class Secretaries and other Technology organizations to form the Tech Reunion Committee, which planned the alumni meeting in June. The committee arranged for a reception tendered to the graduating class of 1905, Friday evening, June 2. The meeting was held in the Engineering Building, and included informal speeches by Dean A. E. Burton and Professor G. H. Barton, '80, and the presentation of appropriate gifts by the classes of '75, '85, and '95. The programme met with such favor that the committee recommends its substitution in the future for the more formal plan of previous gatherings.

The committee has devoted considerable thought to the relation of the Alumni Association to the Association of Class Secretaries and to the mode of election and privileges of associate members. No action is recommended at the present time, but both questions deserve serious attention in the immediate future. The committee also suggests that the officers for the ensuing year might well consider the feasibility of making the *TECHNOLOGY REVIEW* the official organ of the Association.

In accordance with the vote of the Association the following committee was appointed to nominate officers for 1906: Charles T. Main, '76; E. B. Homer, '85; Russell Robb, '88; E. C. Hultmann, '90; and S. C. Prescott, '94.

During the year the number of life members has increased from one hundred to one hundred and thirteen.

Upon recommendation of the Committee on Associate Membership six associate members have been elected since the last annual meeting, making the total number of associate members 172.

Early in April the Executive Committee received from the Corporation of the Institute a request for the opinion of the alumni with regard to a proposed agreement for alliance with Harvard University, a reply to be submitted on or before June 1. In the short time at its disposal the committee attempted to present various phases of the subject fairly by the circulation of two sets of documents, and by holding a public meeting on May 4. The expenses of the ballot, slightly in excess of \$2,600, were approximately met by a grant of \$2,000 from the Corporation and gifts of \$225. The result of the canvass, with a digest of the chief reasons which appeared to influence the alumni in voting for or against the proposed agreement,

were reported to the Association at its meeting on June 2, and that report is herewith submitted for record as Appendix A.

The subsequent votes of the Corporation in relation to the proposed agreement are submitted in Appendix B.

Immediately after the October meeting of the Corporation the sub-committee of this Executive Committee, appointed last year to prepare a plan for alumni representation on the Corporation, was called into conference with the Committee on Nominations of that body. The sub-committee presented a plan involving the addition of elective term members, to be nominated by the alumni, and its provisions with certain changes of detail were approved. At the meeting of the Corporation on December 13 a change in the By-laws providing alumni representation was adopted, which is submitted herewith in Appendix C.*

In accordance with the vote of the Corporation the Executive Committee has prepared certain amendments to the Constitution of the Association, which were submitted in printed form on December 15.

The committee desires to express its gratification at the action of the Corporation, and to recommend the passage of the proposed amendments as submitted.

For the Executive Committee,

ARTHUR G. ROBBINS,
Secretary.

APPENDIX A

REPORT OF THE EXECUTIVE COMMITTEE ON THE ALUMNI CANYASS IN REGARD TO A PROPOSED AGREEMENT BETWEEN HARVARD UNIVERSITY AND THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY, SUBMITTED JUNE 2, 1905

The Executive Committee of the Alumni Association received from the Corporation of the Institute early in April a request for the opinion of the alumni with regard to a proposed agreement for alliance with Harvard University, a reply to be submitted on or before June 1. In the short time at its disposal the committee has attempted to present various phases of the subject fairly by the circulation of two sets of documents and by holding a public meeting on May 4.

Ballots were sent out to all former students about May 18, and the polls were closed May 31.

The alumni have declared by a large majority against the proposed agreement. Of 1,809 votes cast by graduates, 458 favored and 1,351 opposed

* See Corporation Notes on p. 68.

it. Of 1,060 non-graduates voting, 376 favored the plan, and 684 opposed. The vote is approximately 3 to 1 among the graduates, and 2 to 1 among the non-graduates.

From an analysis of the letters, over 500 in number, sent in by the former students with their ballots, the following considerations appear to have had special weight:—

The minority favoring the proposed agreement believe that the income from the McKay Fund would relieve the financial condition of the Institute, and that association with Harvard University would broaden and liberalize the work of the school, enabling it to cope better with the changing problems of modern education and to resist the tendency to narrowness and inbreeding. Many hold that contact with the Harvard undergraduate body and the development of a dormitory system on a new site will promote the acquisition of those broad views and the development of those social talents which are of inestimable value to the engineer in the practice of his profession. Believing in the general principle of combination, they consider that the union of two educational institutions to control the field of technical education in this community would insure concentration of support, promote economy, and avoid duplication. They hold that the independence of the Institute is substantially maintained by the proposed agreement,—that by combination with the Lawrence Scientific School it can give to the community better facilities for training than either institution offers alone, and that it could thus be made perhaps the strongest technical school the world has ever seen.

The majority of the alumni, however, do not find that the proposed agreement secures these, in the main, desirable results. It seems to them so vague and incomplete as insufficiently to safeguard the interests and independence of the Institute, even if it were not dependent on two uncertain court decisions; and to many it is repugnant as tending to divert trust funds from the ends for which they were bequeathed. On the financial side they are convinced that the expense of moving to a costly and in some respects undesirable site, and of accommodating a sudden influx of new students, would for many years more than offset the income from the McKay Fund; and they foresee serious financial loss from the alienation of present friends and future benefactors of the Institute.

Educationally, they believe the application of the principle of business combinations is unsound. In this case the characteristic Technology spirit and atmosphere of earnest work would gradually deteriorate under the influence of an institution of alien temper and by contact with a body of un-

dergraduates of less serious aim. They find no provision in the plan for any real economy or avoidance or duplication, since both Harvard and the Institute continue scientific and even industrial work. They believe that under the agreement the new institution would be weakened by a divided Corporation and Faculty, and by its dependence upon two bodies of indifferent or hostile alumni, and that by an inevitable course of development, tending to complete absorption, it would give over to the University both advanced research and the more liberal branches of undergraduate training. An established present would be exchanged for a doubtful future.

If, on the other hand, this agreement is defeated, and the Institute relieved from the paralyzing agitation and uncertainty of the last few years, the majority of the alumni are confident that they and other friends of Technology will find funds for its support; they believe that its curriculum may be wisely broadened by development along its own lines rather than by an abrupt departure from them; they see many advantages in the present site, if combined with the progressive development of better housing accommodations for the student body on land now available within easy reach; and they look to the enlarged Lawrence Scientific School not as a formidable foe, but as a friendly ally, in the common cause of industrial education.

APPENDIX B

VOTES OF THE CORPORATION IN RELATION TO A PROPOSED AGREEMENT BETWEEN HARVARD UNIVERSITY AND THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY

June 9, 1905:—

Voted, That the Executive Committee be requested, when they may ascertain that the Institute has power to sell the land on which it now stands, to propose to Harvard University an agreement upon the terms of the tentative plan now before this Corporation.

Oct. 11, 1905:—

Resolved, That the Executive Committee be directed to inform the Corporation of Harvard University that, in view of the recent decision of the Supreme Court in the case of John Wilson *et al. v. the Massachusetts Institute of Technology*, the Corporation of the Institute finds it no longer possible to proceed with the plan of co-operation which was considered at the meeting of June 9, 1905.

The Corporation of the Institute desires to express at the same time its

appreciation of the fairness and courtesy of the Corporation of Harvard University in the consideration of this question.

Resolved, That the President be authorized to communicate this decision to the Faculty and alumni of the Institute, and to invite the co-operation not only of Faculty and alumni, but of all friends of the Institute in the development of the Institute in its present site.

REPORT OF M. I. T. ALUMNI COMMITTEE ON SCHOOL

The recent decision of the Supreme Court "relative to the Boylston Street land of the Institute of Technology,"* whereby it was ordered that "the plaintiffs are severally entitled to a decree with cost enjoining the defendant from the erection of any building or buildings covering more than one-third of the area assigned to it by 'Statutes 1861, Chapter 183,'" and the subsequent action of the court in refusing to modify the scope of its decree, have put a final quietus upon the proposed Harvard agreement. Whatever may have been the merits or faults of this plan, the merger is a thing of the past, and the Institute is face to face with quite as serious a situation as confronted it two years ago.

Lacking financial means to keep pace with her normal growth and to maintain her leadership in new fields, limited by restrictions upon the Boylston Street property, seriously cramped for space and equipment for the routine class-room and laboratory work of the student, not to mention the field of research and original investigation, the Institute is suffering most to-day from the effect of the past years of uncertainty and indecision, which have been involved in the careful consideration not only of the recent issue, but of the question of the future location of the Institute and general policy to be followed in the development of the school.

This effect has been inevitable, but, fortunately, the time has come when a definite decision may soon be expected from the Corporation, and when a vigorous and resolute advance must again be made. The initiative does not lie with the alumni, and it would be presumptuous for them to appear even to point the way for the Corporation, but there can be no doubt that, when the policy has once been defined by the Corporation, the alumni can be of service in lending a helping hand in the onward movement. This is no time for criticism or consideration of by-gones, but for a friendly union of all interests, and for the hearty co-operation of the alumni with the Corporation in the future development of the Institute.

Even though it be true that the Institute has suffered by the uncertainties

* Reprinted in the TECHNOLOGY REVIEW of October, 1905, pp. 376-386.

of the past few years, it must not be inferred that the departments have stood still. What they have lacked in some ways has been compensated for in others by the constant interest and devotion of the Faculty and Corps of Instruction.

The decrease in number of students has not been altogether disadvantageous. Indeed, it has been distinctly advantageous in some respects, as notably in decreasing the size of the "Sections."

A renewed effort is apparent, particularly in certain departments, to broaden the work and interests of the students, to educate rather than to train them, and to prevent the development of their imitative faculties at the expense of the perceptive and reasoning faculties. The professional societies, meetings of the students for discussion of current articles in technical journals, and contact with outside engineers and engineering works are also playing an important part in their development.

The change in the entrance requirements in the languages, and the dropping of some of the work in the language department, has given time in the Junior year for the introduction of the so-called "third-year options in general studies," and for more extended professional work. Forty-five hours in the first term and seventy-five hours in the second term are thus devoted to electives in economics, history, English, and modern languages, and it is worthy of note that, "subject to the approval of the heads of their departments, fourth-year students will also be admitted to these general options without requirements as to examination."

In the English department Professor Bates has taken an important step, and perhaps led the way for other institutions, in modifying the entrance requirements in English so as to counteract the tendency to learn by rote and to develop the students' "power to distinguish in a broad sense literary values" rather than to cram "knowledge of specific books." The candidate is "required to write upon subjects *familiar* to him," not upon didactic themes, and is to be judged "by how well he writes rather than by how much he writes," and he is given practically unlimited range of choice in the field of standard literature in the work which he is required to do in anticipation of the examinations. This step seems to be a rational one, and its outcome will be watched with great interest by other institutions.

The same spirit is apparent in the electrical department, in the simplification of the curriculum and the curtailing of the lecture system in favor of more individual class-room and laboratory work; also, in the language department, in which Professor Bigelow, undaunted by the "cut" in time allowed for the languages, has made radical improvements. The work of

other departments in the same line is encouraging, but cannot be dwelt upon here for lack of space.

In the chemical department the number of options has been reduced from five to three by dropping the metallurgical option and merging the option which gave particular attention to fundamental work in mathematics, mechanics, and steam engineering, with a course in chemical engineering. The latter has been strengthened by the introduction of more work in chemistry, made possible by the changes in language requirements referred to elsewhere in this report.

The geological course now offers two options, one in geodesy and one in geology, and is giving an option in geological work to students of Course III.

It is interesting to note the effort being made by the different departments, in some of which the instructing staff already constitutes a good-sized departmental faculty, to stimulate the instructors in their work, and further advance the interests of the department by friendly conferences, discussions of current scientific journals, and lectures or talks, all within the department, upon investigations in progress or new scientific developments. This contact of the different members of the corps of instruction of any department must be of great value.

The research laboratories of physico-chemistry and industrial biology are proving their worth to the Institute, as well as to the public, and frequent calls have come from large organized industries for men fitted to take up research work within those particular industries. While it has been possible to fill some of these openings, others have gone begging.

The growing numbers of graduate students, and the large proportion of undergraduates who come to the Institute, already graduates of other colleges (the latter numbering this year 201 men out of a total of 1,466 undergraduates, or nearly one-seventh of the total number) raises the new and important question to the Institute, as to the extent to which it shall make provision for, or cater to, graduate work. It seems to be generally conceded that it is wiser for the Institute to devote itself primarily to undergraduate rather than graduate work. But, on the other hand, some changes in the curriculum, giving greater flexibility to the graduates in electing fourth and perhaps third year studies, combined with further development of the opportunities for research work along somewhat similar lines to the chemical and physical research laboratories, would seem to have advantages in broadening and strengthening the work of the school, and would, perhaps, furnish a powerful stimulus in maintaining leadership. If re-

search courses are developed, it is to be hoped, however, that they may constitute an integral part of the present departments, and not be under separate management or control, in order that the connection between the undergraduate and the research work may be as close as possible.

Increasing need is felt for more apparatus in certain departments, notably the mechanical and electrical engineering departments, which appear to be seriously hampered in their work in certain fields already very important commercially, in which they have little or no equipment, as, for instance, in the field of superheated steam, steam turbine practice, storage battery work, etc.

But little progress appears to have been, or indeed could be, made upon the dormitory or housing problem. A sensible suggestion has been made by Dr. Dewey, that before undertaking to build large dormitories the experiment might to advantage be tried of leasing a certain number of dwelling-houses, to be run as student boarding-houses and dormitories, under the general supervision of the Institute authorities. Practical experiment along this line, before investing large sums in dormitories, would involve comparatively slight expense, and might shed some light upon the best way of handling this very important matter.

Our well-beloved Dean Burton is abroad upon a year's leave of absence, during which time his office is being filled by Professor Merrill.

Owing to the expiration of the lease upon the land on Exeter Street owned by the Boston & Albany Railroad, upon which the old gymnasium was located, and the need of the railroad for this property, it became necessary to remove the old building. A temporary structure has, therefore, been erected on Garrison Street, which may serve until the new Walker Memorial Gymnasium can be located and built. It seems unfortunate that temporary arrangements could not have been made, perhaps by leasing some old building, which would have saved investment in further buildings of a "temporary" character.

A matter of great interest to the alumni,—alumni representation upon the Corporation,—which was announced by President Pritchett, in his address to the alumni at the Technology reunion, as likely to be taken up by the Corporation in the near future, has recently been acted upon by the Corporation. According to the plan adopted, five men are to be nominated annually by the alumni, of whom three shall be elected annually by the Corporation to serve for a period of five years. Under the provisions of the new plan, when in full operation, the Corporation will consist of three members *ex officio*, thirty-five life members, and fifteen term members.

President Locke and the other members of the Executive Committee of the Alumni Association deserve great credit for the manner in which they, acting on behalf of the Alumni Association, with a committee of the Corporation, have handled this very delicate and important question. The subject is only touched upon here, as it is dealt with fully by the Executive Committee of the Alumni Association in its report.

It is interesting to note, however, in this connection, the good work which has been done by the Technology League, which, though organized for the warlike purpose "to oppose the contemplated alliance with Harvard University, or any similar alliance, to defend the educational freedom of the Massachusetts Institute of Technology, and to promote the influence of the Faculty and past students in its government," has proven its worth in the more peaceful path of collecting facts and evidence relating to alumni representation on the governing boards of the leading colleges, universities, and technical schools. This information has been of great value to the Corporation and the Executive Committee of the Alumni Association in its task of formulating a working plan for alumni representation upon the Corporation, and will aid the alumni to form an intelligent opinion upon the plan to be submitted to them.

Your committee has tried to keep in touch with departmental work at the Institute. With the Harvard agreement agitation it has not directly concerned itself, for the reason that this work could be, and was, done on behalf of the alumni by two very much more effective bodies,—the Executive Committee of the Alumni Association and the Class Secretaries' Association,—the one an elective body, the other, though self-organized and a free lance, a no less loyal and active exponent of alumni opinion.

In this connection, however, it is fitting to call attention to a matter which has impressed your committee more and more forcibly with the lapse of time and the growth and development of the Institute, that the work of this committee could be made much more effective than it is by certain changes: first, by co-operation with the Corporation; and, second, by closer connection with the Executive Committee of the Alumni Association.

It would appear that co-operation of this committee with the visiting committees of the Corporation might be of advantage to the Institute. Unfortunately, a suggestion of this sort cannot, with propriety, be made to the Corporation by this committee or by the alumni. It would seem to be perfectly feasible, however, to bring this standing committee into closer contact with the Executive Committee of the Alumni Association, either by making its members members also of an advisory body or council such

as has been referred to by the Executive Committee of this Association or, perhaps, by making the chairman of this committee a member also of the Executive Committee of the Alumni Association. It is undoubtedly a fact that information frequently comes to members of this committee which cannot with propriety or expediency be published or presented to the Alumni Association, and yet the knowledge of which in proper places might lead to results beneficial to the Institute. This suggests that a closer connection between the Executive Committee of the Alumni Association and the Committee on the School might be of advantage.

On the other hand, it is possible that the plan for alumni representation upon the Corporation, if adopted, may so modify conditions as to make it advisable to abolish or materially change the functions of this committee, particularly in view of the fact that the columns of the TECHNOLOGY REVIEW furnish a natural and ready channel for its comments or reports. It seems wise, therefore, to await the final action upon this matter before making definite recommendations as to the work of this committee in the future.

In conclusion and as of far-reaching importance to the Institute, record is made of the recent and very unexpected resignation of President Pritchett, who leaves the Institute to devote himself to the important work of administering the Carnegie Foundation Fund. It is not to be wondered at, perhaps, that Dr. Pritchett should feel drawn to this work which promises to be of such great benefit to the leading universities, colleges, and technical schools of the United States, Canada, and Newfoundland, for it will not only keep him in close touch with the leading educators and educational institutions in this country, but give him scope for the exercise of his rare capacity as an administrative officer. In the short five years during which he has directed the affairs of the Institute he has made his influence and personal magnetism felt, and the school has made marked progress. He has reached the students in a most remarkable manner, and has broadened their opportunities for wholesome social intercourse and the development of sound ideals of citizenship.

However Institute men may differ with President Pritchett on the past issue of a closer union between the Massachusetts Institute of Technology and Harvard University, they recognize with gratitude and appreciation what he has done for the Institute, and wish him the greatest possible measure of success in his new field.

Respectfully submitted,

LEONARD METCALF, '92.

GEORGE E. HALE, '90.

WILLIAM T. KEOUGH, '88.

EXTRACTS FROM REPORT OF ADVISORY COUNCIL ON ATHLETICS

It has been the endeavor of your Council:—

First. To study the conditions which command the physical development of the Technology students.

Second. To study the forms of athletic sports which are practicable.

Third. To adapt these sports to Institute traditions and Institute life.

Fourth. And, finally, to develop a system of athletic sports to bring out the greatest possible number of students to compete in various branches of exercise, all of which tend to develop the growing youth properly, without straining or overdoing the athletic side of college life.

A wave of college athletic reform is extending across the continent, and it is with no small amount of pride that your Council has shown, by its action, that in past years they had anticipated this condition of affairs, developed a simple system, and encouraged those sports in which the individual athletic work is most prominent. . . .

The progress in college athletics throughout the country, and the recent agitation to abolish football in other colleges, shows that the Institute has been the pioneer in athletic reform, as she has been the leader in technical education. . . .

It seems to the Advisory Council that Technology Field Day, conducted practically as a competition between the Freshmen and Sophomore Classes (at which football, relay racing, and tug-of-war are the events), and cross country, lawn tennis, and golf in the fall and spring, together with basketball and fencing during the winter, and the attention given to track athletics by fall, winter, and spring meetings, and the intercollegiate competition in the spring, give sufficient opportunity for the students to develop on purely healthy athletic lines, without danger to life or limb, and without the necessity of the undergraduate giving up practically half his time each day to athletic training, such as is incident to football, baseball, or rowing; and that, followed out on this plane, the individual student has a better chance to interest himself in athletic work, and at the same time get individual training and exercise.

During the year at least four hundred students have competed in the above sports, and at least as many more have taken athletic exercise, which has been greatly stimulated by having the proper grounds and apparatus to work with. During the fall and spring it is not unusual to see a hundred men at a time on Technology Field. . . .

The other side of the question, however, is wholly financial. All these

sports which our undergraduates engage in are not self-supporting, as is shown by the Treasurer's Report appended hereto, and further than this, although the receipts from the Tech Show have been larger each year, yet the expenses of conducting the athletic interests, such as sending the cross country team to New York to compete in the intercollegiate competition, and the probability of sending the fencing team to New York also in 1906, are constantly increasing, and the Advisory Council will soon be confronted with the proposition that it either must cut off some of these sports or not conduct them in as satisfactory a way as they have in the past, or a contribution or allowance must be made, preferably by the Institute authorities, to assist the Advisory Council in their work. It has been estimated that, if the Advisory Council were given to-day \$1,000, it would place them on a sound and firm financial basis for quite a time to come, and it would seem proper that this should be done by the Corporation of the Institute, as the Advisory Council are to-day, through the various teams, interesting at least one-third of the students in the care of health and bodies in out-of-door work particularly, which is fully as essential as, if not more necessary than, that which can be carried on in the gymnasium.

Further than this, we might add that to-day the gymnasium athletic work is quite different from what it was ten years ago, or even five years ago, the students giving more attention to running, basket-ball, and similar events than to the old-fashioned parallel bars, chest weights, dumb-bells, etc., and that wholesome competition coupled with exercise in the open air is superseding the German system of indoor gymnastic exercise.

The men who take part in athletics, too, are above the average in their standing in scholarship. Out of seventy men who were on the recognized 'varsity athletic teams during last year, none was dropped, and but four were warned. The opinion also of all those who have taken athletic work is that they do their mental work much better and feel in better health than if they did not take it.

ANNUAL DINNER

The dinner took place in the large dining-room of the Brunswick, and was attended by about two hundred and seventy-five persons. The general subject for the evening was "The Future of the Institute," and Colonel Frank L. Locke, '86, the president of the Association, introduced in fitting manner the speakers, who were Presi-

dent Pritchett; Mr. Walter C. Kerr, President of Westinghouse, Church, Kerr & Company, who spoke for the profession; Mr. Desmond FitzGerald, who spoke for the Corporation; Professor William T. Sedgwick, who spoke for the Faculty; Mr. William H. King, '94, and Mr. Charles C. Pierce, '86, manager for New England of the Railway Department of the General Electric Company, who spoke for the alumni. The newly elected president, Mr. Everett Morss, '85, was also introduced, and said a few words.

President Pritchett said: The somewhat warm discussion of the past year has settled two questions and cleared the Institute's policy for the future: namely, the question of an alliance with Harvard and the possibility of removal to a new site. We are to go forward as we have in the past, with no formal relations to the University, but in the friendliest spirit of co-operation; and we must remain, at least for a number of years to come, on our present site. This outlook is in no sense discouraging, but it invites, on the other hand, every Technology man to new efforts for the future of the Institute. We need to at once go to work vigorously to find the money for more land, for new buildings, and for additional endowment.

By a vote of the Corporation a fortnight ago, the alumni receive a large part in the control of the Institute. It should be clearly understood that this carries with it great responsibilities.

Whatever policy as to these matters of site and of buildings the Institute may follow, the great and important things to be aimed at in the next decade seem to me the following:—

First, the freshening and improving of the courses of study. This is a never-ending work in every great institution. In a technical school it is particularly essential that the work of instruction in all courses be considered every now and then afresh, and not simply that modifications be made.

Secondly, with a growing number of graduate students, we must make our courses more elastic, so that the student coming from another college may find it possible to get the work which helps him most.

In the third place, if we are to aim for leadership, we must relatively increase our graduate and research work; and we must offer research, not only in chemistry, in physics, in biology, but in engineering as well. And, finally, we must steadily broaden the student life, and in such a way that students may not only rub against each other, but that they may know their professors in some wholesome, democratic way. I am not sure that

this last is not the greatest need, not only of our own institution, but of every American college as well. The weakness in our college life, from a rational standpoint, is the separation between the intellectual and the social life.

To-day a deal is being said concerning the abuses of football, and these abuses are evident enough; but the chief evils are not the accidental roughness or the occasional brutality, but rather the demoralization of college ideals, the displacement of a right perspective, the encouragement of extravagant habits, and the breeding of a system of graft; and for all these things the responsibility lies not alone with the students, but with the faculties as well, and these things have come about because sports have been developed by youths under the tutelage of professional trainers, and without any real comradeship with the teachers under whom they are sent to study. The cure for present abuses lies, in my judgment, not in the suppression of a particular game. It must go back much further to the real difficulty, the lack of any real companionship in American colleges between teachers and students. What the college student needs is a chance to know, in manly, democratic fashion, good and thoughtful and wise teachers, who possess a knowledge of men and boys as well as of books and laboratories. It is an anomaly in no wise to our credit that what we call college spirit reflects so much more of the professional trainer than it does of the scholar. In some way in our college and in all other American colleges a social life must be developed which shall be the joint life of student and teacher. The absence of such a fellowship upon simple democratic and natural lines is the weakest point in our American institutions.

I am not here to say farewell, although, as you know, my resignation has been offered to the Executive Committee. I count upon being with you for some months. It is no easy thing to bring one's self to separation from a work like that of the Institute, and I have come to such a conclusion only after much anxious thought. No nobler or better work could command the efforts of any man, and in the work to which I go I shall hope still to be in close touch with the Institute and its life; and I can assure you that I shall never lose my affection for the institution and for all for which it stands. I find it difficult to speak of parting from you, and most of all from the student body, without those choking sensations which make speaking difficult.

Mr. Kerr said in part: Long ago some one said that prophecy is dangerous, and many have since found that dealing in futures is uncertain. . . .

It has been said that the results of things follow not so much from their state as from their tendency. So, if this Institute will keep its tendencies right, there need be no worry concerning its state from time to time, nor its final goal.

A few self-evident facts may have a bearing upon its future. It can't become perfect. It can't advance any faster than the arts to which it relates. It can't advance materially faster than the general cause of education. It can't accomplish more than lies within the capacity of its raw material. It can't make an effective man out of a boy in four years. It can't inspire a spirit materially different from that of the atmosphere which it casts about itself. These are some of the limitations, and it probably has others. . . .

I assume that this Institute exists for the purpose of making engineers, whether they be mechanical, civil, electrical, hydraulic, mining, textile, or, by the added grace of art, architects. To this end it must have the right kind of raw material, and then treat it properly.

We are getting too many kinds of engineers. Systematic arrangements in education and in the departmental practice of engineering seem to be giving young men the idea that the scope of their attainment is the adjective by which it is known. They are thus led to specialize when too young, and wander away from the opportunity of being all-around men.

There is much educational theory which flies too high. There is too much weighing of one finely spun method against another, resulting in an over-academicness of method, leaving out of the reckoning some of the simple quantities which are the essence of the equation.

That a man may be educated in engineering, he must first be capable of becoming an engineer. Preparatory education will not make him capable, and entrance examinations will only partially test his capacity. We need a new standard in our educational institutions, which shall be a combination of entrance requirements and a mode of determining whether a man is endowed with engineering, architectural, or other technical faculties. This is not the time or the place to define how this shall be done, but that it can be done there is no doubt.

Many a young man comes to his Freshman year with five thousand dollars spent on his education since he was thirteen. He passes creditably, and takes high rank from the start. It may be that he would not become a real engineer if he stayed in the institution the rest of his natural life.

Another comes from humble surroundings, with few advantages, and perhaps is unable to pass the high entrance standard required. He has studied no modern language. He is not advanced in mathematics quite

to the entrance requirements. But he may have equal ability to perform undergraduate work and twice the engineering capacity of the man who passed his entrance examinations *cum laude*. I think the second man needs the opportunity more than the first. . . .

The sifting process may eliminate undesirable men after they have entered, but there are too many processes to prevent a certain desirable type of man getting in. Soon he stops applying, and then it is forgotten that he exists. There is something wrong about our entrance method. . . .

In an institution located so far to one side of the centre of population, it is probable that most applicants have the advantage of the excellent school systems of the East. But this Institute does not want to draw its student body largely from a local class. It needs the democracy of variation, which requires it to assemble its material from a broad range. It should avoid provincialism, and, while enjoying the advantages, it should stoutly resist the limitations of its special environment.

There is, therefore, an extra burden upon any institution located in the midst of a dense population to foster special endeavor to develop the man from within, as would naturally occur in the freer environment separated from the artifice which the world has set up and called advantage.

No one, I believe, doubts that the great preponderance of physical and mental strength, the capacity to do, the steady, resolute nerve that wins losing battles, comes in the main from the country, and not from the city. Lochinvars come out of the West. This is a great country. Its people are evolving too fast for close analysis. The highest development has been reached in the Eastern border. The most rapid development is farther west. The type of man who is making the greatest impression upon the progress of this nation is developing many hundreds of miles west of the Atlantic coast, and the Eastern education must, as time goes on, reckon with the evolution.

There is a self-sufficiency with which most Eastern institutions regard this which will make them losers in the friendly race which is being run. There is also a broad democratic spirit through which the Eastern institutions can become a part of the larger development, providing they do not flock aside and harbor a wrong impression of their relative position. There is no inherent reason why an institution should be better in Boston than in Michigan, the Mississippi Valley, or California. There is likewise no reason why the forces which are at work in the Middle and Far West should eclipse the advantages possible in these Eastern centres.

When an institution like this sets apart an occasion for the contemplation

of its own future, I would make a special plea for that future to be measured by the whole length and breadth of the land, regarding only as an incident the fact that the institution happens to be located in Boston. . . .

Consistent with this motive, it is not well to have a faculty composed of men who are too similar. There needs be a variation in type, temperament, and experience in men and teachers who are looked up to by youth as models of learning and performance. . . .

It would be better for many professors personally, for their work and for the students under them, to shift a few times in the course of their career from one institution to another or from their academic to the world's work.

A plan has already been inaugurated elsewhere by which the younger professors of the engineering faculty are required to spend about one-half of their time in practice in variable periods of a few years each, as may be determined by the director. This process has many advantages and some embarrassments, which cannot be recounted here. . . .

I think the future is safest when, instead of following a predetermined course, it is committed to hands that dare to do right things, regardless of precedent. The radius of action of such an institute is long. Its future and its opportunities are as broad as our land, the possibilities of which were graphically set forth in John Fiske's story of a French banquet held shortly after the close of our Civil War, and at which various countries were represented:—

Mr. Brown was called upon to respond to the toast of the United States, lately emerged from her conflict, "bounded on the north by the British possessions and on the south by the Gulf of Mexico, on the east by the Atlantic and on the West by the Pacific."

He responded by saying that he preferred his colleague, Mr. Davis, should speak to the United States *of the future*, "bounded on the north by the north pole and on the south by the south pole, on the east by the rising of the sun and on the west by the setting of the same."

Mr. Davis arose, and replied that, as it seemed the toast was to be the future, with no limit as to the boundaries, he would propose that the real American speaker of the occasion, Mr. Sterling, reply for the United States *of the future*, "bounded on the north by the Aurora borealis, on the south by the precession of the equinoxes, on the east by primeval chaos, and on the west by the Day of Judgment."

Mr. Fitzgerald said in part: Early in the history of the Massachusetts Institute of Technology, President Rogers raised over its portal the banner

of "Intellectual Freedom." Storms of various kinds have since raged around the motto then unfurled, but in no case has that banner ever been lowered. It still flies undaunted in the breeze. Should the intellectual freedom of the Institute ever be seriously threatened, then indeed we may have cause for alarm.

Recently the peaceful waters have again been disturbed, and I suppose deep down in the hearts of all true friends of Technology there is a profound sense of relief that this storm, too, has passed, and that we have now only to unite in continuing the good work of adding more stones to our fair superstructure. An engineering work which safely withstands the assaults of some great freshet is doubly secure, and such I firmly believe to be the present position of the Institute.

I am to say a few words to you to-night in behalf of the Corporation. It is needless for me to assure you that the Corporation is an assemblage of very able and distinguished sons of the Commonwealth, whose first and only aim is the entire success of the Institute. We cannot be blind, if we would, to the long line of noble men who have given us the example of the most self-sacrificing devotion to the best interests of the school. The honored names which rise readily to our lips recall devoted service of time and money given freely for the upbuilding of as fair an institution of learning as ever impressed its influence upon mankind.

The Corporation cherishes with pride the traditions of its work, small though that work may be when compared with that of the Faculty or the alumni. It is true that at times, as all men are liable to err, we have had divided counsels. Some "will-o'-the-wisp" may have bewildered the senses with its glittering glare, and turned a majority from the clear and spiritual light of day toward some golden harvest beyond the pale, but, happily, these dangers have been averted. I count it one of the brightest harbingers for the future that the Corporation, almost as a unit, have recently adopted the suggestion of the alumni for alumni representation in the Corporation.

This action has been taken with such good grace and with such hearty celerity that it may well be the source for deepest satisfaction. It speaks volumes for the future of the Institute.

President Pritchett once said, "The fame of the Institute rests upon the work and reputation of the alumni." I think at this time he forgot all about the Faculty, but perhaps he made it up to them on another occasion. At any rate, as a member of the Corporation, I wish to say that I believe a large part of the glory of the Institute rests with the Faculty. For nearly half a century the Faculty have borne the burden and heat of the day, and

to their able, faithful, conscientious work are due the high standing and characters of the alumni. Nothing can dim the honor which must be attached to their constant efforts. Upon their shoulders rests the great burden of educational work and the educational policy of this great school. It is only necessary to glance at some of the distinguished names on the rolls of sister institutions to be reminded that not only has Technology retained its own masters of education, but it has provided an overflowing reservoir of instructors, professors, and even presidents for other fields of activities. Among the latter I may well be pardoned for alluding to the fact that Tech furnished its older sister across the Charles with that bright, particular star which so long and so honorably has held the first place in that part of the firmament. Every Tech man is, I believe, as proud of President Eliot as if he were the head of our own staff. His great ability, his unswerving devotion to the cause of education, his fairness in battle, are all a part of the glory of Technology. It is true that he has been recently credited with the heartless desire to capture us bodily for his own Harvard, but, however thankful we may be that the plan for turning us into a "Merger mule," to quote the graphic language of Dean Shaler, has miscarried, we cannot be unmindful of the fact that President Eliot only manifested his good taste when he turned his eye in our direction. Personally, I never lose an opportunity to read everything that comes from the lips of the President of Harvard. His addresses are full of rich and varied thought, and yet simple and easy to understand, as characteristic of all good art. They are singularly pithy in their outlines of the questions of the day. In a recent review of a philosophical nature, Dr. Eliot has declared that the real object of education should be to teach the young how to live happy and useful lives rather than to fit them for earning a livelihood. It is with extreme diffidence that I wish to suggest that this is exactly what we are endeavoring to do at the Massachusetts Institute of Technology; for is it not true that, when we teach man to subdue the forces of nature for the good of humanity, we offer him at the same time the sure reward of true happiness?

And now, gentlemen, a single word in closing. As alumni, your accomplishments have added to the glory of the Institute, but in the long record you have done nothing worthier of praise than your recent efforts to bring about alumni representation in the Corporation. The William Barton Rogers Fund, the Walker Memorial Fund, and now the Technology Fund testify to your self-sacrifice in the cause of your Alma Mater; but, in the new field which seems to be opening to your view, your opportunities for usefulness

are to widen, and you are to be brought into even closer relations with the progressive development of that grand institution in whose homage we have now assembled and whose reputation we guard with jealous care.

Professor Sedgwick said in part: Constitutions are not made but grow, and the same is true of institutions. From this standpoint, and from this alone, we can form some accurate idea of the future of the Institute. True growth means not merely increase in size, but also increase in structural differentiation and increase in kinds or varieties of capacity or power. It means, of course, increasing specialization.

In the original "Memorial," drawn up by our great founder in 1859, the new Institute was described as designed "to equip its students with every scientific and technical principle applicable to the industrial pursuits of the age." To this idea of its main function it has ever since adhered, and, as the industrial pursuits of the age have multiplied and differentiated in the nearly half-century which has since gone by, the Institute has grown and differentiated correspondingly.

One of the difficult problems for any scientific and technical school, such as ours, is now, and will be still more in the future, to determine how much time to give to the purely scientific and how much to the more technical principles, for I do not need to argue that to teach much more than principles is, in these days of expanding knowledge, a physical impossibility. The teaching of knacks, tricks, short cuts, and detailed processes, is usually, and is likely to remain, unwise: the teaching of fundamental facts and general principles is now, and always will be, indispensable.

Above all, we must never forget that a stream, though it cannot rise above its source, may sink far below it, and that any school of applied science which aspires to attain and to maintain leadership must see to it that the springs of pure science within it, from which all technical knowledge ultimately comes, are not allowed to run dry. It will always remain one of the chief glories of the administration of Francis A. Walker that he thus broadened and strengthened the Institute from within; and I devoutly hope that the Institute of the future may be further strengthened, rather than weakened, in this direction.

The commonest and easiest criticism of technical schools is that of "specialization," or narrowness. I have no time to deal at great length with this criticism, in which, as in most criticisms, there is some truth; but I do desire to cite a defence of our intensive education and a justification of specialization, which I have long regarded as a sufficient answer to

superficial critics. And this not from any "specialist" or any "narrow technologist," or even from a scientific man, but from one of the broadest and ablest and most distinguished of the older professors at Harvard, Professor Palmer, himself formerly a teacher of Greek and now a teacher of philosophy: "I have no doubt," says Professor Palmer, "that specialization is destined to become more marked in the American education of the future. It must become so if we are to produce the strong departmental scholars who illuminate learning in other countries; indeed, it must become so if we are to train competent experts for the affairs of daily life. The popular distrust of specializing is sure to grow less as our people become familiar with its effects, and see how often narrow and thorough study, undertaken in early life, leads to ultimate breadth. It is a pretty dream that a man may start broad and then concentrate, but nine out of every ten strong men have taken the opposite course. They have begun in some one-sided way, and have added other sides as occasion required. Almost in his teens Shakespeare makes a specialty of the theatre, Napoleon of military science, Beethoven of music, Hunter of medicine, Hugh Miller of rocks, Faraday of chemistry, Hamilton of political science. The great body of painters, musicians, poets, novelists, theologians, politicians, are early specialists. In fact, self-made men are generally specialists. Something has aroused an interest, and they have followed it out until they have surveyed a wide horizon from a single point of view. In offering wider opportunities for specialization, colleges have merely been assimilating their own modes of training to those which prevail in the world at large." (G. H. Palmer, "The New Education," pp. 102-104, Boston, 1887.)

It is an interesting fact that competent foreign critics, instead of deploring the "narrowness" of the Institute, as some of our alumni and others have done, constantly express surprise at its breadth. I may quote, for example, the latest of a long series of foreign visitors, the Principal of the University of Wales, who, only a few weeks ago, in addressing the graduates of that university, told them that,

"Where a professional or higher technical school is established in England, the tendency is to make it purely technical, to banish all literary studies, and confine the students' attention strictly to scientific profession. In America a broader view is taken. . . .

"The technical course itself in the great majority of cases includes a culture element, supplied not by Latin or Greek, but by French or German, history, civics, and economics. The Massachusetts Institute of Technology in Boston, the greatest school of the kind on the continent, makes literary

studies of this kind an indispensable part of the curriculum." (*Nature*, p. 44, Nov. 9, 1905.)

As for the attitude of the Faculty toward this matter, I believe that we feel, even more keenly than any outsiders, the great need in our students, and in ourselves, of all possible breadth compatible with such professional attainments as are indispensable. We welcome all practicable increase of the so-called culture element: we deplore all abridgment of it, whether among or within the courses. And I gladly seize this opportunity to express my own appreciation of the remarkably thorough, painstaking, and judicious work of our teachers of English history, economics, and statistics, who, in the face of many discouragements, have intelligently and ably grappled with the difficult problem of the conduct of these studies in a technical school, and, in my opinion, have gone far towards mastering it.

However, I am happy to report to you that, in pursuance of a long-cherished plan, the Faculty, having recently increased the entrance requirements in modern languages, on its own motion and not because of any external pressure, instead of seizing for professional work, as it might easily have done, all the time in the third year set free in consequence of the change, has definitely and cheerfully appropriated to general, cultural, or liberal studies a large proportion of that time. I desire to read you the list of subjects, and to ask you to reflect, as I read it, whether or not any technical school which, in addition to studies, already required of all students, in English, French, German, history, literature, political science, and a generous amount of summer reading, now further requires three hours a week to be spent during the first term of the third, or Junior, year, upon one of the following subjects, namely: economic history, advanced English composition, English literature of the eighteenth century, French (four courses), Spanish, comparative national government, international law, and the history of science; and in the second term five hours a week upon one of the following subjects, namely: railroad economics, banking and finance, labor problems, the organization of industry, contemporary literature, English literature of the nineteenth century, French, German, Spanish, municipal government, colonial systems, and European civilization and art,—whether, I repeat, a technical school doing these things is not doing about as much in the way of requiring so-called liberal studies as can reasonably be expected at present.

If we would discover the probable characteristics of the Institute of the future, we must inquire carefully what are its characteristics to-day and what they have been in the past. If we do this, we shall find, I think,

that the qualities which especially characterize the Institute as an educational organism are:—

First. High seriousness, earnestness, and strong purpose to achieve.

Second. A conviction of the necessity and the dignity of labor.

Third. An appreciation of the educational value of scientific and utilitarian studies.

Fourth. Professional standards and the professional spirit; and

Fifth. For and in our graduates capacity for immediate and intelligent service.

I do not, of course, suppose that every student or every teacher who comes to the Institute brings either a clearly defined purpose to achieve, or earnestness and high seriousness, but I do believe that the great majority come bringing with them, consciously or unconsciously, these preliminary qualifications.

Before a body of alumni who have borne the burden and heat of many a day in the Institute, I do not need to prove my second proposition; namely, that the Faculty and the students of the Institute have a rooted conviction of the necessity, the dignity, and, I may add, the efficacy, of hard work.

Many marvel at the attachment of our alumni to their Alma Mater, finding in their affection for the Institute something surprising among men for whom there exist no associations with ancient halls, hoary towers, or classic playgrounds; but those who know the deeper and more abiding bonds of association in honest, hard, and fruitful labor know also that the ties which grow up between fellow-workers, and between students and teachers, rigorous, but just, are akin to those which unite the veterans of war, the heroes of the battlefield.

A third characteristic of the Institute is its ineradicable belief in the educational value of utilitarian studies. In the early days of the Institute, when our great defender, Dr. Bigelow, pleaded for us against the mediæval schoolmen at the American Academy, it was necessary to insist, as he did continually, that between the educational value of classical and utilitarian studies no real or natural line can be drawn. To-day only the echoes of this controversy can now and then be heard, for all the world has learned that it is not so much what, as how, we study, that determines the quality or degree of learning; and few can now be found who dare deny that accurate learning and genuine scholarship may exist as truly in the technical school as in the university.

Lastly, one word more about the standards which have governed, do still govern, and, in my humble opinion, will continue in the future to govern

the Institute. These, as I do not need to tell a body of our alumni, are those of all high and noble professional life: namely, truth, accuracy (which is only another name for truth), skill (a word allied by derivation both to science and to conscience), capacity (which is only another name for power), and responsibility, the ethical handmaid of power.

Knowing the traditions and routine of the Faculty as I do, and knowing the temper and standards of the students as we all know them, I can harbor no shadow of doubt that the Institute of the future will develop along these already characteristic lines. Men do not gather figs from thorns or grapes from thistles, and, conversely, they do not gather thorns from figs or thistles from grapes. Living organisms breed true, and the Institute is a living organism.

But in order to live in the future worthy of the noble traditions already formed, and to expand and develop in the future according to the industrial wants of the age, we must patiently work on along the old lines and gradually develop new ones. We cannot stand still, we shall not go backwards, we must surely go forwards. To do this, we need to get the best possible raw material in the form of new students, the most effective living machinery in the Faculty, and the most wise and courageous leadership from President and Corporation. Then to the public which we serve, and to which we must look for support, we will say, as Montaigne's mariner of old said to Neptune in a great tempest: "O God, thou mayest save me if thou wilt, and if thou wilt thou mayest destroy me; but, whether or not, I will steer my rudder true."

Mr. King said in part: The great honor has been conferred upon me of expressing the loyalty and devotion of the graduates, their earnest desire to co-operate in the upbuilding of the Institute, their deep and steadfast faith and confidence in its future.

We are looking forward. As President Pritchett has said, "The questions upon which we have honestly differed are now out of the way." We desire simply to secure, so far as in us lies, as men united in the achievement of a common object, the success of the Institute of Technology. We believe in its principles and what it has accomplished, and we are desirous of aiding in its future work. In response to the invitation of the Corporation contained in the recent letter of the President to the alumni and former students, we pledge our hearty co-operation, "with the ambition," as the President ably says, "to make the Institute the most efficient means possible of ministering to the intellectual, moral, and social life of its students."

We are not reformers, and we have no desire to dictate future policy. We believe that the maintenance of the high standard of the scientific as well as the general work may be intrusted to the able men having the courses in charge. But we hope to be of assistance, and in this spirit I offer the suggestion that, to a certain extent, general studies may profitably, without detracting from scientific work or unduly encroaching upon the limited time of the students, be still further extended.

Graduates must enter into relations with men who know little of their special knowledge and training, and general information and culture must be the medium through which they gain the respect and confidence of these men, and thus the opportunity to bring their scientific knowledge into most effective use. If they have not received such benefits, they are at a disadvantage at the beginning of their career. What an assistance it would be if, for instance, in addition to the outside lecturers on scientific subjects, students were brought more in contact, even for short periods, with able men engaged in pursuits of literature and art, finance and business, and thus felt the influence not only of the subjects which interest such men, but the personality of the men themselves!

In suggesting the advantage of somewhat extending subjects of general information, I refer principally to purely scientific courses, for, though convinced that a wide field for usefulness awaits the re-establishment and development of the former course in general studies, my loyalty to the Institute is not measured by my regard for and belief in that course.

No stronger evidence could be produced of the earnest intention of alumni to co-operate than the fact that the graduates of Course IX., a large body of men occupying positions of trust and responsibility, have united in the common effort for the upbuilding of the Institute.

We all agree upon the principle of scientific education. That principle, first successfully applied on the broadest lines by our noble founder, President Rogers, and continued by President Walker,—men who have been a tower of strength and a source of inspiration,—merits the success which it has achieved. The duty and honor of perpetuating that principle has come to us as a priceless heritage. We are united, Corporation, Faculty, and graduates, in its application and extension, in the worthy task of achieving a splendid future for the Institute. In this effort we shall not have the ability and energy of President Pritchett.

All the more is it our duty, who remain charged with responsibility, to co-operate to the best of our energy in the cordial and earnest effort to secure the highest success. We regard the maintenance of our Institute in the

same spirit displayed by Webster when he said, speaking of the Temple of Justice, "Whoever clears its foundations, strengthens its pillars, adorns its entablatures, or contributes to raise its august dome still higher to the skies, connects himself in name and fame and character with that which is, and must be, as enduring as the frame of human society."

Mr. Pierce said in part: I have listened with the greatest pleasure to the kind words of the speakers in regard to the Institute to-night, and although I am no battle-scarred hero, as Professor Sedgwick is, I wish to say something for the associate member.

The associate member must be reckoned with in your future organization, whether you believe it or not.

Now I am one of the few who do not believe that the Institute of Technology is absolutely perfect.

The Institute, as I remember it twenty-three years ago,—and I have kept pretty closely in touch with the Institute since,—was an institution formed primarily to manufacture and deliver engineers. I do not think that is right. I do not think that the Institute can ever make engineers. I think the Lord makes the engineer. He is born, and all that you professors can do is to take that piece of material furnished you, and fashion it.

The main thing that the Institute, in my judgment, should teach is originality. That is what the world pays for,—originality in thought, originality in action, originality even in manner.

The Institute of Technology was gotten up with the idea of educating men under the best conditions. It is not a poor boy's paradise, and it should not be made so. You ought to develop engineers of the grandest kind. I firmly believe the Institute to-day stands on a new threshold. When this unpleasant little affair came about, when people honestly disagreed in regard to the future of Technology, there was then a new Tech born. We have this Tech. It has been handed over to the Alumni Association, and, to put it into simple, common business parlance, the Alumni Association and the people who have stood for this new Tech have made a bluff, and it is up to us to-day to make good.

President Morss said in part: I wish to thank you for the honor you have done me in electing me to this position. We have heard here to-night two things: First, that the Institute is not absolutely perfect to-day, although we are very proud of some of the things she has accomplished in the past. We have also heard that the responsibility is on the alumni for her future, under present conditions, more than ever before.

Those of us who are on the outside can afford to leave to the President and Corporation and the Faculty the details of how the educational problem should be worked out; but it is, in my opinion, absolutely up to us to support them in the financial point. I think we all realize that, no matter how wise the administration may be, they can't go ahead and do the things which ought to be done if they have not got a dollar in the world to do it with, and everything done in the line of progress costs money.

If you look back and consider every year for twenty years, you will find that it costs a good deal more per student to-day than it used to cost. And that is the situation we have got to face. The money has got to come from somewhere in order that the development of the Institute shall be carried out as it has got to be if we are going to make good. The Technology Fund was conceived before the merger proposition ever came up. It was started during the merger discussion. Its fundamental idea was to promote the development of the Institute. The main part, perhaps, is the collection of endowments from outsiders. And in addition to that is the collection of money for the present needs of the Institute to tide over the time until the endowment can be raised. The committee is not exactly dead: it is not even asleep, as will be shown very shortly. And I wish to ask that you will give us your most hearty co-operation, realizing your responsibility. The problem is not, how little you can give to get out of this scrape, but How much can you do for the advancement of the cause?

We have to-day approximately \$200,000 in subscriptions. It is my hope that we may practically finish this thing up by the June meeting, and present the subscriptions to the Corporation,—not \$200,000, but something very much in excess of that.

GENERAL INSTITUTE NEWS

CORPORATION NOTES

The stated Corporation meeting of December 13 was mainly given to the presentation of the annual reports of the President and Treasurer, extracts from which appear elsewhere in the REVIEW. At the close of his report President Pritchett announced to the Corporation that he had, on the previous day, presented his resignation to the Executive Committee. The President stated that he is to take up the work of the Carnegie Foundation, with headquarters in New York City. Dr. Pritchett stated, further, that Professor A. Lawrence Lowell had asked to be relieved of the duties of membership upon the Executive Committee of the Corporation. Mr. Lowell's resignation was, with much regret, accepted by the Corporation, and a number of the members expressed their high appreciation of the services of Dr. Pritchett and their regret at his decision to resign the presidency.

The Committee on Nominations presented to the Corporation a plan for amending the By-laws of the Corporation to provide for term members to be elected from lists submitted by the Alumni Association. After discussion and slight amendment the following amendment was adopted by a practically unanimous vote:—

AMENDMENT TO THE BY-LAWS OF THE CORPORATION

Section A.—No further election of members of this Corporation shall be held under the provisions of Section I. of the present By-laws until by death or resignation the number of life members shall have become reduced below thirty-five. Thereafter the number of such life members shall be limited to thirty-five, who shall be elected as provided in said Section I.

In addition to the members elected for life there shall be elected fifteen members to hold office for terms of years, as set forth in the following sections.

The provision of said section I. limiting the total number of members to not more than fifty shall be suspended until the total membership shall

have become reduced, as herein provided, to thirty-five life-members, three members *ex-officiis*, and fifteen term members; and the limit of membership shall thereafter remain at fifty-three.

Section B.—The Nominating Committee shall present to the Corporation at the regular March meeting of 1906 fourteen names, selected by letter ballot by the Alumni Association, and shall report concerning the same. These names shall be voted for at said meeting by ballot, each member present being entitled to vote for nine persons out of said fourteen, and the three persons receiving the largest number of votes shall be members of the Corporation to serve for five years. The three persons receiving the next largest number of votes shall be members of the Corporation to serve for four years. The three persons receiving the next largest number of votes shall be members of the Corporation to serve for three years.

Section C.—In each year subsequent to 1906 the names of five candidates for term membership shall be presented by the alumni Association to the Nominating Committee of the Corporation thirty days previous to the March meeting, and the names thus presented shall be reported to the Corporation at said March meeting by said committee, with its report thereon. These names shall be voted upon at said meeting by ballot, each member present being entitled to vote for three persons out of said five, and the three persons receiving the largest number of votes shall be members of the Corporation to serve for five years.

If any vacancy occurs among the term members through death, resignation, or otherwise, the Alumni Association shall present to the Nominating Committee of the Corporation thirty days previous to the March meeting next following the occurrence of such vacancy two names for each vacancy, in addition to the five names prescribed in the preceding paragraph, and these additional names shall be reported by said Nominating Committee to the Corporation, together with the five names provided for in the preceding paragraph. These additional names shall be voted upon at said meeting by ballot, each member present being entitled to one vote for each vacancy, and the person or persons receiving the largest number of votes shall be members of the Corporation to serve for the unexpired term or terms.

Section D.—In case of a tie affecting any election for term membership, the names of the persons receiving an equal number of votes shall be re-submitted for election at the same meeting.

Anything hereby directed to be done at the March meeting may be done at any adjournment thereof.

It shall be the duty of the Nominating Committee to send the names of the persons presented for term membership to each member of the Corporation at least two weeks before the March meeting.

Term members shall hold office for their respective terms with all the rights, privileges, and duties pertaining to membership in the Corporation under its By-laws.

Term members shall at no time be eligible for re-election until at least one year after their last term of service has expired.

Only members of the Alumni Association who have not been connected with the Institute as students for at least five years shall be entitled to vote for term members.

PUBLICATIONS

The annual catalogue was issued the present year slightly in advance of the normal date, December 1st, a considerable gain over the date of issue in earlier years when the Register of Graduates was included. In spite of the omission of the Register, the present catalogue numbers more than four hundred pages.

The principal changes compared with the issue of last year are as follows:—

Changes in the Faculty. Professors: Clifford, Vogel, Bartlett, Merrill, Miller, Walker, promotions; Bigelow, new appointment. Associate Professors: Norton, Fay, promotions; Mott, new appointment. Assistant Professors: Mulliken, Haven, Leland, Drisko, Smith, Winslow, Doten, Johnson, promotions; Coolidge, Spofford, resignations.

The remodelling of all the course schedules in the third year consequent upon the increased entrance requirements in modern languages.

The introduction of the Options in General Studies (p. 72).

The rearrangement of the options in the Course in Chemistry, and a practically complete change in the character of the Course in Chemical Engineering.

A thorough revision of the Course in Geology and Geodesy.

The expansion of the statement with reference to Summer Courses (p. 74).

A change in the form of examination in English required for entrance (p. 102).

The introduction of an Alphabetical Subject Index (pp. 114-119).

The arrangement of Scholarship Funds in the order in which they were acquired by the Institute (pp. 308-312).

The addition of four new alumni associations: The Technology Club of Rhode Island, The Technology Club of New Bedford, Vermont Technology Association, The Technology Club of Hartford.

Considerable effort has been made to improve the arrangement of the matter, particularly in the latter portion of the catalogue, and the typographical appearance of the whole work. The catalogue has been printed entirely from new type and a new copy of the seal used on the cover.

GRADUATE SCHOLARS

Fellows, by the present faculty definition, are either students who are working for the degree of Doctor of Philosophy, Science, or Engineering at the Institute, or Institute graduates who are especially appointed by the Faculty for study at other institutions.

The number of candidates for the degree of Doctor of Philosophy at the Institute is seven, all in the Research Laboratory of Physical Chemistry. The separate classification of graduate scholars has been discontinued.

LEWIS AND CLARK EXPOSITION

DECEMBER 12, 1905.

INSTITUTE OF TECHNOLOGY, BOSTON, MASS.:

Gentlemen,—It gives me great pleasure to officially notify you that your exhibit at the Lewis and Clark Exposition was awarded a gold medal. These medals are furnished by the Exposition management in bronze (marked gold), and are not engraved. The Massachusetts Board of Managers have ordered them engraved and plated with gold. We hope to deliver them some time in January.

The Massachusetts Board of Managers have also ordered a silk banner to be given as a souvenir with each exhibit that received a gold medal. These banners we are presenting with our compliments and with thanks for the splendid exhibits prepared and intrusted to our care.

If you have not already received your exhibits, you should do so in a few days.

Very respectfully yours,

(Signed) WILSON H. FAIRBANK,
Executive Commissioner.

GENERAL NOTES

On December 13 the Institute was visited by a special commission from the University of Toronto, consisting of Sir William R. Meredith, Chancellor of the University, Mr. J. W. Flavelle, Canon H. J. Cody, Dr. D. Bruce Macdonald, and Mr. A. H. U. Colquhoun. This commission was appointed in October to examine into the condition and administration of the University of Toronto, and to make recommendations for its reorganization. After visiting the Institute, the commission were given a luncheon at the Technology Club, in order that they might meet the members of the Corporation and Faculty.

Professor Bjerknes, of Stockholm, who has been giving a course of lectures on mathematical physics at Columbia University, spent a few days at the Technology Club early in January, and gave an illustrated lecture at the Institute on "Hydrodynamic Fields of Force." The attendance included many members of the instructing staff of Harvard University as well as of the Institute, and Professor Bjerknes's remarkably interesting experiments were greatly enjoyed.

Professor Swain has given a series of readings from standard authors on Wednesday afternoons from four to five o'clock. This course has been arranged by Professor Swain in order to interest men taking Civil or Sanitary Engineering in good books and good reading.

G. W. Rolfe, Instructor in Sugar Analysis, has gone to Porto Rico, where he is to take charge of a sugar plantation on the Constanca Estate. During the three or four months that he will be away, A. G. Woodman will take charge of his work at the Institute.

Through the generosity of Dr. H. W. Newhall, of Lynn, Mass., the Institute has recently come into possession of a number of interesting and valuable mineral specimens, which formed a part of a collection made a number of years ago by Dr. Newhall, father of the present donor.

There has recently been placed in the library of the Electrical Engineering Department a portrait of the late Augustus Lowell, who was for so many years actively identified with the best interests of Technology and for whom the laboratories of electrical engineering are named. The portrait is presented by his sons.

Charles Tidd Baker, deceased, the well-known insurance broker, whose office was at 85 Water Street, gave twenty thousand dollars to the Massachusetts Institute of Technology. In connection with this handsome gift, he says in his will, "I hope this bequest will lead others to do likewise."

The officers whom the Instructors' Club has elected for this year are: Mr. G. W. Rolfe, president; Mr. J. Blachstein, vice-president; Mr. S. H. Thorndike, secretary and treasurer; and Messrs. N. R. George and C. M. Swan, members of the Executive Committee.

The friends of Professor William E. Mott, of the Department of Civil Engineering, will be deeply grieved to learn of the sad bereavement which has come to him in the death of his wife. Mrs. Mott was a most charming and accomplished woman. The greater part of her married life had been passed in Ithaca, where, as the head of a delightful and hospitable home, she made hosts of friends by whom she will be sadly missed. She had been ill for several years, but, since coming to Boston only a few months ago, her condition had become more serious, and she had been unable to take up any social duties, and hardly to renew old friendships made here in previous years. Her disease made rapid progress and she passed away on the 12th of December. Her death leaves a void in many hearts which cannot be filled.

Following a custom established several years ago, the heads of the various courses have given a series of talks to the Freshman class on the work of the different departments. The purpose of these talks is to help the men in choosing the line of study which they will follow during the next four or five years, and to give them a better understanding of the work which lies before them.

The holding of the annual meeting of the American Association for the Advancement of Science at a point so remote as New Orleans, precluded attendance of members of the Instructing Staff. Meetings in New York and Baltimore were attended by several members of the departments of mathematics, physics, and economics.

The dates for the spring intermission, fixed by the Faculty, are Thursday, Friday, and Saturday, April 26, 27, and 28.

DEPARTMENT NOTES

CIVIL ENGINEERING

The staff of instruction of the Civil Engineering Department has experienced more change this year than for some time past.

Professor C. M. Spofford, class of 1893, who has been connected with the department since 1896, has resigned to accept the position of Professor of Civil Engineering at the Brooklyn Polytechnic Institute. Professor Spofford, whose work has been mainly devoted to instruction in structures, bridge design, and railroad field work, will be greatly missed by his associates, but their good wishes for his future success go with him in his new position.

Five of the assistants of last year, Messrs. Blum, Hartshorne, Holbrook, Stetson, and Thurlow, have resigned to engage in outside work, and all have secured good positions.

The additions to the teaching staff of the department have been Professor William E. Mott, Mr. George E. Russell, and seven assistants from the class of 1905; namely, Messrs. John Ayer, James E. Barlow, Carl T. Humphrey, John H. McManus, Willard E. Simpson, Frank C. Starr, and Kilborn Whitman, Jr.

Professor Mott comes to the Institute as Associate Professor of Hydraulic Engineering, after a long experience in teaching at Cor-

nell University, where he occupied a similar position. He has also had outside experience, and is a mature teacher and engineer who will greatly strengthen the instructing staff of the department.

Mr. George E. Russell also comes from Cornell University, where he has been an instructor for the past year. After graduating from the Institute in 1900, Mr. Russell remained here as an assistant for one year, and then resigned to accept a position with the American Car and Foundry Company, with which corporation he had an experience of three years, which familiarized him not only with the engineering problems of such a corporation, but also with business matters as well. He returns as Instructor in Civil Engineering, to devote himself once more to teaching as a profession.

Mr. S. H. Thorndike will devote himself henceforth principally to bridge design and stereotomy. His experience in the City Engineer's office of Boston renders him well qualified to undertake this work, in a great part of which he will take Professor Spofford's place.

Mr. J. W. Howard, 1903, after two years of very satisfactory work as assistant, has been promoted to be Instructor in Civil Engineering.

The teaching force of the department is now larger than ever before, comprising seven members of the Faculty, five instructors, and seven assistants.

Many of the members of the instructing staff of this department devote themselves during the summer and to a considerable extent during the winter to outside work. Professor Swain during the past year has been consulting engineer for the new bridge across the Connecticut River at Chicopee, having prepared all the designs and specifications for the work and superintended its construction. The resident engineer on the work was Mr. C. T. White, of Springfield, of the civil engineering firm of Durkee, White & Towne. This bridge is now nearing completion. It consists of seven riveted spans of 170 feet each, on masonry piers. Professor Swain has recently been employed as consulting engineer for the new bridge across the Merrimac River at Haverhill, for which plans and specifications are now being prepared.

Professor McKibben has been engaged in assisting Professor Swain in his work, involving the designing of masonry and steel structures and the inspection of bridges for the Railroad Commission.

Professor Allen, during the fall, had a call to go to South America to examine a railroad property, but concluded that it was wisest not to undertake it.

Mr. C. B. Breed during the past summer has been Assistant City Engineer of Lynn. He has been consulted by that city with reference to the plans for abolishing grade crossings, and has given particular attention to the study of that problem. He has also been engaged in other capacities.

Mr. G. L. Hosmer has been engaged during the past summer on the magnetic observations in Labrador, conducted under the auspices of the Carnegie Institution.

Mr. Thorndike, as before mentioned, has been engaged in the office of the City Engineer of Boston, to which work he devotes his spare time during both summer and winter.

Mr. J. W. Howard has been engaged during the summer as instrument man by the Massachusetts Harbor and Land Commission. Of the new assistants, Mr. Ayer was engaged during the summer as transitman on some railroad location work. Mr. Barlow was rodman for the Charles River Basin Commission, Mr. Simpson was in the Maintenance of Way Department of the Southern Pacific Railroad, and Mr. Whitman was rodman for the Metropolitan Park Commission.

The class graduating last year was the largest ever graduated from this department, numbering 56 in civil engineering and 9 in sanitary engineering. This number, together with the assistants who resigned and some special students, made a total of about seventy students available for positions. Notwithstanding this large number, the number of applications for men has been entirely out of proportion to the number of men available. The number of such applications received up to November 7, suitable for men in the graduating class has been 128, so that the department could have found positions for many more men than were available. Of the

positions offered, 16 were in strictly structural work, 47 in railroad work, 12 in municipal work, 18 in hydraulic engineering work, 3 in sanitary work, 12 in teaching, and 20 in business or miscellaneous positions.

MECHANICAL ENGINEERING

The improvements in the Course mentioned in the TECHNOLOGY REVIEW of last July have now become effective in the third and fourth years, so that the Course is much benefited by the facts that, besides a very considerable increase in the time devoted to literary subjects, there has been a decided gain in the time devoted to Differential Equations, in that devoted to the instruction given in Electrical Engineering, and also in that devoted to each of the four options.

The total number of students to whom instruction is given in Mechanical Engineering subjects, including, of course, students of the second, third, and fourth years of many Courses in addition to those taking the Mechanical Engineering course, is, this year, 822, a very large part of the total number of the second, third, and fourth year students attending the Institute. Instruction is given in Applied Mechanics to 425 students.

The number of candidates for a degree in Mechanical Engineering is, this year, 79, and this large number of fourth-year students, combined with the lack of a sufficient amount of apparatus in the laboratory, has rendered it necessary to have an unduly large amount of the thesis work performed outside the laboratory, which is in continuous operation, and is very much crowded.

The department has received as a gift, from the Westinghouse Air Brake Company, a complete and modern air brake equipment for an electric car.

Several members of the instructing staff of this department have been called upon for additional work in connection with the administrative work of the Institute, with the work of the Lowell School for Industrial Foremen, and in other connections.

The publications of members of the department during the past year have been as follows:—

- Gaetano Lanza. New and revised edition of "Applied Mechanics."
Gaetano Lanza. Memoir of Professor L. Tetmajer, Proc. Am. Soc. Testing Materials, 1905.
Gaetano Lanza. Report of Committee on Standard Methods of Tests. Proc. Am. Soc. Testing Materials, 1905.
Edward F. Miller. "Practical Instructions on the Use and Care of the Crosby Steam Engine Indicator." Edited by Edward F. Miller.
S. H. Woodbridge. Report to Congress on Central Plant for Executive Building.

ARCHITECTURE

The changes made during the past summer in the drawing-rooms have already shown the best results. Additional windows have increased the working floor area, and the wall space gained by dividing up the great rooms into alcoves has provided amply to show off the splendid collections of original drawings which the department owns, and which hitherto have had little chance of being seen or used to the best advantage. The collections are particularly rich in the choicest work of the Paris Beaux-Arts. Perhaps the most interesting group is Pascal's competitive drawings for the Hotel de Ville at Paris, a gift from Mr. Pascal himself. Among other drawings of this distinguished architect are those which won for him the Prix de Rome. Then there are the original Envois de Rome by such men as Tournaire, Chaussemuche, Recouré, Chiffot, and the famous drawings by Brune which still hold their own in comparison with the splendid more recent work.

Bringing together the third, fourth, and graduate classes in the way that has been done has already given promise of good results. In putting together these seventy-five men of different degrees of experience and ability, in increasing the *esprit de corps* (which has never been wanting), in giving the weakest as well as the strongest the opportunity of direct association with the best instructors, we have succeeded in combining in the regular instruction all the best qualities of the French atelier, in which, after all, is the essence of the Beaux-Arts. The rooms are crowded, but there are no complaints, and the amount of work accomplished leaves nothing to be desired.

The new exhibition room, which makes for a very important part

of the instruction, and is designed to contain simply the current work as completed, measures sixty by twenty-five feet. This seemed large when first laid out, but nearly every week there is a new exhibition covering its walls, and the room is always an attractive resort for the student. The student's work is hung here, least of all for the sake of exhibition, but because of the opportunity it gives the instructors to criticise it before the classes. At the end of each problem this criticism takes place. Its value is such that no student will willingly miss it, and what is learned through this sizing up of one's work and by its comparison with that of others is the greatest aid in helping one to learn to criticise himself and make the most of his reasoning powers.

The only further condition needed, in the opinion of Professor Chandler, to give the department its complete strength, is to require five years for the degree instead of four. He says that every student should be made to take the opportunity now offered in the graduate class, for it represents a year's study of subjects essential to the highest professional success, and which the student is now prepared to undertake because of his training during the previous four years. Even with a five years' course there would be demanded less for the degree than is required by the professions of Law, Medicine, or the Ministry. The strides taken by the graduate students are always a surprise, and no better proof of the quality of work accomplished during this year when one is released from the strain of the Tabular View is that architects seeking for draughtsmen invariably ask first for men from the graduate class.

A very attractive address was recently given to the fourth-year students by Mr. Gorham P. Stevens, '98, in relation to his work on the Acropolis while holding a scholarship in the American School in Athens. Mr. Stevens's connection with the school lasted a year and a half, during which he devoted much time to the measuring and drawing of the Erechtheum in all its details. Until then that most interesting building had never been exhaustively studied, and it was a great compliment paid to the American School by the Greek authorities, when it was given the opportunity of so doing. The architect needed, in his share of the undertaking, had to be most thor-

oughly trained and appreciative, and withal a most skilful draughtsman. The search finally settled on Mr. Stevens, who had returned recently from his studies at the Paris Beaux-Arts, and was then in the office of Messrs. McKim, Mead & White of New York. These gentlemen were willing to loan Mr. Stevens for the time needed. Mr. Stevens's address told of his share of the work on the Erechtheum, of the interesting discoveries made in Greek constructive methods, and of the opportunities which this exhaustive research has given the school to solve some of the vexed questions peculiar to this building. His remarks were illustrated mainly by slides made from photographs of his drawings, and they were of such good quality as to make one long to see the originals. Mr. Stevens's part in this undertaking is the most interesting, of course, to architects; but the whole work is to appear eventually in print, published by the American School, and it ought to have the greatest interest for architect and archæologist alike.

Mr. Stevens is now back again with Messrs. McKim, Mead & White.

ELECTRICAL ENGINEERING

There has been placed in the library of the department a crayon portrait of the late Augustus Lowell, given by his sons. The portrait is the work of Baldwin Coolidge, and the likeness is strikingly good. It is peculiarly gratifying to have this remembrance of one who was for so many years actively connected with the best interests of the Institute of Technology, and one for whom the Electrical Engineering Laboratories are named.

Through the courtesy of Matthew C. Brush, 1901, Vice-President of the Boston & Suburban Electric Company, the Seniors in the department spent the afternoons of the week of October 30 in an inspection of the Lexington power station of this company. In connection with this visit a formal report was submitted by each student for criticism, the department of English co-operating.

On Wednesday evening, November 1, the Electrical Engineering Society held a meeting at the Tech Union. The speaker of the evening was Dr. F. B. Jewett, of the engineering staff of the American

Telephone and Telegraph Company, who spoke on "Some Limitations in Long Distance Telephony." The paper of the evening was followed by a social hour.

At the Journal Meeting of December 7, Mr. C. A. Bettington, mechanical engineer of one of the large companies operating on the Rand in South Africa, described a device for the burning of powdered coal when mixed with air, to be applied to any type of boiler. Experiments in connection with this are already being conducted at one of the stations of the New York Edison Company with most promising results. Mr. Bettington is carrying on certain special work in the department.

On the evening of Thursday, December 7, the Electrical Engineering Society held a meeting in Room 6, Lowell Building, the address being made by Mr. J. L. Jones (VI., 1903), New England representative of the Gray National Telautograph Company. He spoke at some length on the history of the invention and its present uses, and exhibited a set in actual operation. The meeting was very largely attended.

Professor A. S. Richey, who has recently come to the Worcester Tech from the Indiana Traction Company, spent the morning of November 10 in looking over the equipment of the department and in discussion of its methods of instruction.

On the afternoons of Tuesday and Wednesday, December 19 and 20, the Senior Class visited the works of the Simplex Electric Company in Cambridge, and will submit, as is usual with these excursions, a formal report. This visit was made possible through the courtesy of Henry A. Morss (VI., 1893), Vice-President of the company, and on the Saturday previous Mr. Morss gave an illustrated lecture, discussing the various processes concerned in the insulation of wire.

The Ridgway Machine Company has loaned to the department a Thomson-Ryan variable speed motor.

The Lincoln Electric Company is also to send one of its variable speed motors, and a comprehensive series of tests will be carried out on these two machines as a part of the regular thesis work of this coming term.

There has been received from the National Battery Company of Buffalo, N.Y., a board containing samples of the various types of battery plate manufactured by them.

The Westinghouse Electric Company has furnished copies of photographs illustrating some of the various types of apparatus of its manufacture.

The work with the Lowell Foremen is being conducted along the same lines that were followed during the past year, and in addition a course of lectures and laboratory work is being given under the auspices of the Lowell Institute to members of the Eastern Association of Physics Teachers.

The lectures on the "Mechanical Engineering of Electric Power Plants" have been completed by Mr. Howard L. Coburn. This placing them thus early in the term is an advantage, in that the information obtained is available for the students in their various excursions to power plants about Boston.

The greater part of the work in the Standardizing Laboratory is now accomplished in the second term of the third year, thus leaving the Senior Year, so far as this work is concerned, for the investigation of such special problems as may arise in connection with thesis work.

Professor H. W. Smith will spend the second term in visiting various technical institutions in this country and abroad, returning for the opening of the school in the fall of 1906.

GEOLOGY

Professor Jaggar, collaborating with Dr. Charles Palache of Harvard, recently published a folio of the Geologic Atlas of the United States on the Bradshaw Mountains, south of Prescott, Ariz. The folio contains topographic, geologic, economic, and structure section sheets of a mining district a short distance from the famous United Verde copper mine. The region is distinguished by intrusive granites and diorites in highly metamorphic sedimentary rocks of Algonkian age. In addition there are large areas of surface volcanics. The gold and silver occur chiefly along the borders of certain diorite bodies.

During the Christmas holidays Professor Jaggard went to Ottawa to attend the meeting of the Geological Society of America. He was the guest of Dr. R. A. Daly, of the Geological Survey of Canada.

Professor Johnson, during the recess, attended the meeting of the Association of American Geographers in New York, and presented two papers as follows: (1) Drainage Modifications in the Headwaters of the Chattahoochee and Savannah Rivers; (2) Map studies for engineering students: The Classification of Contour Maps on a Physiographic Basis (illustrated with lantern views and maps).

Professor Crosby, who has been engaged during the autumn in professional work in Alaska, returned to the Institute late in January.

PHYSICS

Several changes have been made in the lecture course in General Physics, and others are in contemplation. How extensive these may be will be largely determined by the practical results of the entrance requirement in Physics, which went into effect at the last examination for admission to the Institute. Independently of this, however, it has seemed expedient to try the experiment of greatly abbreviating the treatment of certain topics in the required course, and establishing at the same time brief optional courses in which these subjects may be treated more fully than would be desirable in the former. Last spring ten such lectures upon the phenomena of the electric discharge in vacua and radio-activity were given by Professor Cross, open to students of all years above the first. No examinations were required of those attending these lectures. It is in contemplation to offer a like course upon electrical oscillations, Hertz waves, and allied phenomena. If this is done, the two courses will probably be given in alternate years.

In the lectures upon Heat in the third year, now given by Professor Norton, considerable attention is devoted to the applications of heat in the arts, especially in the matters of cold storage, the maintenance and control of furnace temperatures, the critical examination of fuels, and the heat problems relating to fire prevention.

A journal club has recently been established in the department, in care of Dr. Wendell, meeting once in two weeks for the considera-

tion of current literature. It is open to instructors and advanced students.

The department has procured a number of valuable pieces of demonstration apparatus during the past summer, especially in illustration of high frequency currents, electrical oscillations, and electrical waves. In particular the device of Seibst for demonstrating the tuning of a circuit to different harmonics is worthy of notice. The collection of vacuum tubes has been increased, and further additions have been made for illustrating ionization of gases and radio-activity. From the gift of Dr. Jacques there have been purchased for the workshop a bench-lathe and a vertical drill.

Much new apparatus has been added to the laboratories. In the Electro-chemical Laboratory the following are especially worthy of notice: a new type of Lippmann electrometer designed for measuring very small voltages, apparatus designed for the investigation of gas batteries, for solubility-determinations of very insoluble salts, glass thermostat and accessories for viscosity determinations, and a new heating system for maintaining the electroplating baths at any desired temperature.

The Optical Laboratory has received the following among other new instruments: a "flicker" photometer, a Lummer-Brodhun contrast photometer, a Mayer heliostat, and an air interference table with variable thickness of air film.

The special appropriation made by the Executive Committee for more completely equipping the Laboratory of Heat Measurements has allowed much needed improvements to be made.

Practically, all apparatus for regular class work has been duplicated, including combustion bombs, a Parr calorimeter, thermoelectric and resistance pyrometers, the optical pyrometers, and the comparator. A number of new pyrometers, including a recording instrument, have been purchased. A refrigerating plant for the study of heat insulating materials used in cold storage, and one also for the study of specific heats, etc., at cold-storage temperatures are about ready. A large and accurate apparatus for the measurement of the effectiveness of different steam-pipe and boiler coverings has been built by the Insurance Engineering Experiment Station

for commercial testing, and is now in use by several students in connection with their thesis work.

The conflagration loss of the last year has led to a more careful consideration of methods of preventing spread of fire, and a very exhaustive examination of the relative fire-resistance of different kinds of roofing has been going on in the laboratory for some months. During the last summer a series of tests, attended by representatives of the insurance interests and the building trades, was made on fire-proof woods now in use.

CHEMISTRY AND CHEMICAL ENGINEERING

The department has had occasion during the past few months to realize the increase in the demand for able men to assume positions of responsibility as teachers of technical chemistry in our institutions, and also for men who are capable of directing the work of the research laboratories which are being established by various industries for the better investigation of the scientific problems involved in their daily practice. It has been at once a matter for congratulation and embarrassment that several members of the instructing staff of this department should be regarded as eminently fitted to fill these positions, and it is the Institute's good fortune that the attractions have not, with one exception, been sufficient to induce the instructors to leave us.

In August last Dr. Walker was asked to become the head of the Chemical Department of the Carnegie Technical School at Pittsburgh, under tempting conditions. Early in the fall Dr. John W. Brown, Instructor in Theoretical Chemistry, was offered, and has now accepted, a position in which he will have charge of the research laboratory of the National Carbon Company at Cleveland, Ohio. Still more recently Dr. Henry Fay was offered the directorship of a laboratory in connection with the Westinghouse Electrical Company at Pittsburgh, which is to be also essentially a laboratory of research. Of these instructors Dr. Brown will, to the regret of the Department, leave the Institute to assume the duties of his new position on January 1, and his work will, for the remainder of the present year only,

be distributed among other members of the instructing staff. It is a satisfaction to state that the flattering offers made to Professors Walker and Fay did not lead them to leave the Institute. Dr. Walker, through his contact with technical chemistry and his training and aptitude as a teacher, is singularly fitted for success in his work with us, while Dr. Fay is by training and experience also unusually well equipped for his responsibilities in the care of the instruction of the large number of students in analytical chemistry; and both are eminently successful teachers.

It is interesting to note that the establishment of these laboratories of technical research has been greatly stimulated as the result of the marked success attained by Professor W. R. Whitney, in the laboratory of the General Electric Company at Schenectady. More complete fitness for the work in hand is rarely shown than is evident in the case of Dr. Whitney, and it is gratifying to find that the results of his untiring labor are receiving recognition.

Dr. Walker has within two months retired from the firm of Little & Walker, of which he has been a member since 1901. He will continue to utilize a portion of his time for expert consultation work in technical chemistry and chemical engineering, and has recently accepted an offer to give a course of three lectures a week throughout the year on Technical Chemistry at Harvard University, a course formerly given by Professor Sanger. This is a University course, open to college students as well as those of the Lawrence Scientific School. Professor Walker has also been appointed a member of the Organization Committee of the Sixth International Congress of Applied Chemistry, to be held at Rome in April, 1906.

As a further evidence of the demand for teachers of technical chemistry and chemical engineering comes the appointment of Mr. J. C. Dickerman (X., '95) as Assistant Professor of Chemical Engineering at the University of Wisconsin. Mr. Dickerman has been associated with the Merrimac Chemical Company for a considerable time, but has found himself increasingly interested in a teacher's work. He will take with him into this work a considerable fund of experience, and enters upon it with apparent promise of success. Mr. R. J. King (III., '03) has assumed Mr. Dickerman's responsi-

bilities at the Merrimac Chemical Company's works at South Wilmington, while Mr. G. V. Sammet (V., '01) who took his Ph.D. degree at Leipsic last May, has entered the employ of the same company, in part at least to carry on work of the general nature of research.

Drs. R. W. Balcom and S. C. Lind, who completed their work at Leipzig and Heidelberg, respectively, in the last summer semester, are now at Ann Arbor, both holding instructorships at the University of Michigan, where they are associated with Professor S. Lawrence Bigelow (V., 95), and are reported as successful in their work.

Mr. R. S. Williams, Assistant in Analytical Chemistry last year, is studying with Professor Tammann at Göttingen. Many of the German universities have recently adopted stringent regulations regarding the admission of foreigners, and also regulations regarding American students from other than a limited number of our institutions of learning, which are likely to cause embarrassment to Institute students going abroad for study. An effort will be made to secure a better appreciation on the part of German authorities of the work done by students of the Institute.

The series of six lectures on the "Historical Development of Chemistry," by Professor Ostwald, mentioned in the October REVIEW, have been given on successive Thursdays, beginning November 9. The first lecture was given in English, the remainder in German. The audience has included, besides many of our own students and instructors from various classes and departments, representatives of a number of other institutions. Professor Ostwald has sketched the development of the most important chemical concepts in a way which was interesting and suggestive, both because of new standpoints from which to view past attainments and because of suggestions as to the directions in which effort should be made to advance the science in the future.

In the early fall Drs. Talbot and Blanchard published a book on the "Electrolytic Dissociation Theory," an elementary treatise, in which they have sought to bring together in a compact and simple form the facts which are generally accepted as supporting this theory, and to show the application of the theory to a few typical cases of

chemical change. The book is being used in connection with the instruction in Inorganic Chemistry, and was prepared for this purpose primarily. This theory has assumed so much importance in chemical science that it must be considered as equally a matter for consideration with the older theories, and this book is proving to be of assistance by placing the material in the hands of the student in suitable form for home study.

Mr. G. W. Rolfe's excellent book on "The Polariscope in the Chemical Laboratory" is proving helpful in the instruction in Sugar Analysis and kindred optical methods. The title of the book was wrongly given as "Methods of Optical Analysis" in the July REVIEW.

Mrs. R. H. Richards is to give a series of six lectures on "Sanitation" at Cornell University in January. Besides the third volume in the "Cost of Living Series," on the "Cost of Shelter," she has also written a pamphlet on "Healthful Homes," issued by the Health Education League. Mrs. Richards and Mr. Taylor have under investigation methods for the determination of chlorine in water and a field method for dissolved oxygen in water; and others are investigating standard methods of water analysis under Mrs. Richards's direction.

Dr. E. C. Levy, who worked for some time in the Chemical and Biological Departments, has recently been appointed City Bacteriologist of Richmond, Va., and has made reports upon the milk supply and the pollution of the James River.

Professor Talbot has been appointed a member of the Committee on Standard Methods of Testing of the Society for Testing Materials, and of the Sub-committee on Chemical Tests, and has recently attended meetings of this committee and the Board of Examiners in Chemistry of the College Entrance Examination Board at New York. He has also been elected a member of the Executive Committee of the New England Association of Chemistry Teachers.

Professor Gill is a member of the Committee on Standard Tests for Lubricants of the Society for Testing Materials.

Mr. G. R. Taylor has charge of the instruction in chemistry in the evening schools of the city, and is assisted by Mr. A. L. Smith.

MODERN LANGUAGES

The number of students who failed to meet the entrance requirements in foreign languages made it necessary to form two sections in French I. and three in German I.

The courses in French III. and German III. have been reduced from three hours to one hour per week, and made third-year options.

The number of students in Spanish is larger than ever before. There are six sections in this language, reciting to Mr. Erhardt, Mr. Lenz, and Professor Bigelow. A section was formed in Italian, but had to be abolished to provide the necessary instruction in Spanish, now the favorite third-year option.

Experimentation with the graphophone has been continued. While the department sees some usefulness in this machine, it has doubts as to its durability, and consequently as to the advisability from an economical standpoint of investing in it to any considerable extent.

Professor Vogel, who has been chief reader in German for the College Entrance Examination Board during the years 1904 and 1905, has been appointed one of the three examiners to prepare the questions in German for 1906. The marking of the papers takes place in June at Columbia University. The professor this year edited and published a German reader, entitled "Geschichten aus der Tonne," by Theodor Storm, and is now engaged in the preparation of a scientific German reader. Mr. Dike is preparing a French Scientific Reader.

On the 9th of November Professor Bigelow read a paper before the Boston Group of the New England Modern Language Association on "Modern Language Teaching with Special Reference to Pronunciation and Conversation," in which he pleaded for more oral work, with less English.

NAVAL ARCHITECTURE

The Department of Naval Architecture has planned and started a long lecture course on subjects concerned with marine construction. In their particular lines of marine engineering the lecturers are all well grounded and the subjects are both interesting and

varied. The fundamental principles of naval architecture will be talked upon, and some of the lectures will deal with methods of ship designing, the construction of floating and graving docks, and the surveying of ships for repairs.

EXTRACTS FROM THE ANNUAL REPORT OF THE PRESIDENT AND TREASURER
OF THE CORPORATION, DEC. 13, 1905.

Extracts from Report of the President

... No new buildings have been erected during the past year, with the exception of the new Gymnasium building on the Garrison Street land adjoining the Mechanical Laboratories. . . . During the last year there have been no changes in the Corporation and those in the Faculty have not been numerous. . . . The student registration of this year as compared with that of last year shows a diminution of approximately one hundred names; that for last year being fifteen hundred and sixty-one, that for the present year fourteen hundred and sixty-six,—a loss of ninety-five names. . . . It is interesting to note that this diminution comes entirely from near-by States, namely from the States of Massachusetts and New York, for New York next to Massachusetts has always been the chief source of students for the Institute of Technology. . . . On the other hand, there has been a gain instead of a loss from nearly all other States, including those in the West, like California, Michigan, Illinois, Missouri, and Minnesota, in which the State Universities are making the most rapid gains.

These losses and gains are to be explained, to my mind, on the following ground: local students are those who feel the most acutely a raise in the tuition fee or in the expense of student life; and this diminution in attendance may be referred to their efforts to secure cheaper tuition. The reduction in attendance of students from New York is doubtless due in similar manner to the attractions of Cornell University, where very great facilities are being offered engineering students at a less cost than in Boston. On the other hand, an increase in tuition does not affect students from abroad in the same way, because such students, as a rule, must have fair resources in order to attend a distant institution at all. . . .

The number of graduate students has increased from one hundred and eighty-one last year to two hundred this year. Twenty-eight of these are candidates for advanced degrees.

Students from foreign countries number sixty-six, compared with fifty-four of last year. These come from twenty-five countries. . . .

[There follows a history of the Harvard Technology Alliance, including, for the first time in print, the Tentative Plan of Nov. 14, 1904.]

. . . A decision was handed down by the Supreme Court on the sixth day of September, which denied to the Institute any right of this property in fee simple, and specifically enjoined it from either selling or building over the two-thirds area not now occupied. This decision made the carrying out of the agreement entirely impossible for many years to come, unless there should be provided promptly a sum of money approximately equal in amount to the value of the land on Boylston Street. As the probability of raising this sum seemed indefinite, and as it was undesirable to leave the matter in a state of uncertainty, the Corporation of the Institute at its meeting on October 11, 1905, instructed the Executive Committee to indicate to the Corporation of Harvard University the fact that this body finds itself unable to go on with the plan. The correspondence which closed this matter is given below:—

PRESIDENT CHARLES W. ELIOT,
HARVARD UNIVERSITY, CAMBRIDGE, MASS.

My dear President Eliot:—

I am directed by the Corporation of the Institute of Technology to communicate to you the fact that, in view of the recent decision of the Supreme Court of the State in the case of John Wilson *et al.* vs. The Massachusetts Institute of Technology, the Corporation of the Institute finds it impossible to proceed with the plan of co-operation which was considered at its meeting of June 9.

In communicating this fact the Corporation desires at the same time to express its appreciation of the fairness and courtesy of the Corporation of Harvard University in our common effort to solve a difficult question.

I am,

Very sincerely yours,

HENRY S. PRITCHETT,
President.

OCTOBER 11, 1905.

At a meeting of the President and Fellows of Harvard College in Boston, Oct. 30, 1905 the following vote was passed:—

Voted, That the committee of conference appointed by this Board May 16, 1904, at the instance of the Corporation of the Massachusetts Institute of Technology be hereby discharged; and that the President be requested to express to the members of the two committees of conference the high appreciation by the President and Fellows of the foresight, good judgment, and public spirit of which the committees' project for a close affiliation between the Institute and the University gives evidence, and the regret of the President and Fellows that the project has been brought to naught by the recent decision of the Supreme Court, which makes it impossible for the Institute to place itself beside the University.

Voted, To acknowledge hereby the receipt of notice from the Corporation of the Massa-

chusetts Institute of Technology that the negotiation with this Board started by the Institute May 4, 1904, is at an end.

A true copy of record.

Attest:

JEROME D. GREENE,
Secretary to the President.

I have called attention in my two last annual reports to the desirability of outlining as definitely as possible the future policy of the Institute in respect to a location and to its intellectual and educational aims. The proposed plan of alliance with Harvard University was such an effort: it was definite, and was framed to meet a policy which contemplated one great school of technology rather than two. That plan having been dismissed, it remains to turn heartily and earnestly to the development of the Institute in its present site; for it seems to me clear that the decision of the Supreme Court, which made the alliance impossible, has also settled the question of site for at least a number of years to come. We must, as it seems to me, continue to use the land on Boylston Street, and, therefore, for certainly twenty or twenty-five years, the Institute must continue where it has been in the past.

The policy of the Institute, therefore, for the next quarter century seems to me to be stated somewhat definitely in the following way:—

1. To acquire additional land in the immediate vicinity of the present Engineering Buildings, sufficient to provide for the normal development of the next quarter century.
2. To provide money for endowment and for building so as to make this site the seat of an effective and well-equipped group of engineering buildings.
3. To develop on our Brookline site, adjoining the Athletic Field, dormitories for such students as may desire to avail themselves of a community life; these dormitories being constructed on the plan of furnishing simple and inexpensive rooms for men of small means, as well as more ambitious rooms for those who care to pay for them, for the purpose of bringing men together on a democratic plan.
4. To develop with sound judgment and true perspective in education the intellectual work of the Institute. And while this is put last, it is, of course, first in importance and significance in any institution. The quickening of the means of instruction, the constant examinations of the courses to the end that they may serve best the student's needs, a frequent over-hauling of requirements so as to preserve a fair perspective of student work,—these are the most important matters of policy which an institution has to settle, and these, of course, lie in the hands of the Faculty.

It is some such programme as this to which it seems to me the Institute of Technology should now commit itself heartily and enthusiastically.

The question of what is the best form of administration for an educational institution has received increasing attention in the last two years.

In most American institutions the administration has assumed a form much more resembling that of a business organization than is the custom in foreign universities and technical schools.

Whether this tendency is a good one or not is certainly an open question, for, however desirable it may be to secure a due sense of responsibility on the part of teachers and students, it is also true that the best intellectual results are likely to come with a larger measure of freedom. On the other hand, it is also evident that an administration in which the individuality of the teacher and of the student is conserved offers serious difficulties in the way of what may be called initiative. When a course of study or a change in the plan of organization or other important question within the institution is to be determined by the votes of a large number of men acting on their individual judgment, it is evident that the inertia of the organization must be much greater than if the power is lodged in the hands of one man or in a small body of men. Nearly all administration is a compromise between these two ideals,—the ideal of the executive officer or small committee with large power insuring well-defined responsibility throughout all parts of the organization and also power of initiative, and the other ideal of individual freedom of action based on the consent of all members within the organization and necessarily, therefore, acting slowly, and without great initiative.

It seems clear to me that the idea of the individual freedom of the professor is a fundamental condition in any institution of learning. It also seems to me equally clear that this freedom must extend in some measure at least to the student, and that also some means must be had to increase the power of initiative of our educational organizations. Our institutions of learning are conducted on the intellectual side wholly by the Faculties. These have now become quite large in the larger institutions, and, when we introduce the ideal of the preservation of individual freedom and combine it with the plan of organization which assigns only a single professor to a single subject, we preserve a system which has the faults of both plans of organization. It remains, perhaps, for the American professors themselves to suggest some means of administration which, while preserving the individual freedom of the professor, may at the same time give to educational organizations somewhat of the initiative which we find in business organizations.

A partial step toward this result would be reached in the Institute if the separate Departments of professional study were considered as schools and the determination of their courses of study left more fully to these

separate Faculties. In fact, the name Institute would most fitly indicate a congeries of schools; and it ought to be possible to administer the School of Architecture, of Civil Engineering, and the like without losing the trust which now exists between Departments having these names, while leaving to each larger initiative. . . .

The athletic life in the Institute of Technology represents, in my judgment, a sane and normal development. There is a very hearty athletic spirit and this shows itself principally in the cross-country runs, in the track team, and in the other events in which the individual can most easily enter. . . . When one considers in how great measure the athletic development in our colleges and universities has displaced scholarship, the present situation in the Institute of Technology is one in which there is a certain amount of satisfaction. In the Institute to-day athletics remains still a sport, and it has become neither an occupation nor a business. . . .

EXTRACTS FROM REPORTS OF DEPARTMENTS *

Department of Electrical Engineering

. . . The matter of the course scheme has been considered by the Department with great care and at considerable length. The conclusions reached are that a radical simplification is most desirable, in fact is absolutely necessary, since the students are working under pressure on too many subjects. The time for the digestion and assimilation of what is presented to them and for clear and careful thinking must be very considerably increased. This can be brought about by the elimination of certain work of lesser importance and the devotion of greater time to exercises, both written and oral, under the immediate supervision of the instructing staff.

The reports of students in connection with the excursions to the various power plants in Boston and vicinity have shown a very great gain in clearness of expression and logical arrangement, due in no small degree to the co-operation of the Department of English in this particular line of work. . . .

Department of Biology.

. . . A sudden, unexpected, and unexplained decrease in the number of students in the Department, in the face of a larger demand than ever for its graduates, and in spite of other favorable conditions, occurred at

* Much of the interesting matter in these reports has been already covered by the "Department Notes" in the REVIEW, and therefore is not reproduced.

the opening of the present session. This is perhaps due partly to the radical change of the Course in General Studies, from which good students have frequently been recruited; partly to the diminishing number of women studying at the Institute, but mostly to causes as yet obscure. It has always been difficult to convince first-year students desiring to pursue the course, or to persuade their parents, that biology is a really practical subject, although students in other courses who have reached their third and fourth years often report that, if they had understood, in their first year, what the course in biology is and what it leads to, they would have elected it without hesitation. Against this difficulty we shall doubtless long have to continue to struggle, in spite of the fact that we are, and for several years have been, unable to meet the demand for graduates in biology, owing to the limited number electing the course, and in spite of the fact that those who have taken it have readily found remunerative employment and promotion. In a technological school like the Institute, some pains will doubtless have always to be taken to bring strongly before the students the opportunities offered by the more scientific as compared with the more technical courses. It seems desirable that some way should be found to make it more generally known than it is, both by the student community and by the public at large, that the courses at the Institute in Physics, Chemistry, Biology, and Geology are no less likely to lead to honorable and self-supporting careers for those who may elect them than are those in Engineering. . . .

Reports upon biological analyses, inspections, or investigations are often sought and are often important for municipalities, manufacturers, corporations, or individuals; and yet it is obviously impossible for officers of the Institute to make such examinations and reports in their official capacity, or, if they are extensive, upon the Institute premises. To meet similar needs, there have sprung up in the neighborhood of some educational institutions private laboratories, owned and directed by the officers of those institutions, but otherwise not connected with them. The numerous demands made upon the Biological Department for such aid as is described above, and the desirability of meeting these demands, have induced Assistant Professor Prescott to open during the summer a private laboratory of Industrial and Sanitary Biology and Chemistry in which such outside work can be done. Professor Prescott's laboratory bears the name of The Boston Bio-chemical Laboratory, and is already in successful operation under his direction with the aid of two assistants technically trained at the Institute. It is believed that by the inauguration of this laboratory a real public

need will be satisfactorily met, while opportunity will also be furnished in it for certain investigations in Industrial Biology and Bacteriology which could not be readily undertaken upon the premises of the Institute. . . .

Department of Physics

. . . A most important advance which has just gone into effect in connection with the instruction in physics is the requirement of a certain knowledge of that subject of all students entering the Institute. Too much ought not to be expected from this, but it is hoped that the possession of a certain amount of elementary knowledge of the subject by the students at the beginning of our more extended course will allow a broader and in some respects more philosophical treatment than has hitherto been practicable. . . . It will allow illustrations from all branches of physics to be introduced to make clear the earlier portions of the course, and will make possible from the outset the use of certain assumptions the truth of which the student will at least recognize, even if he does not possess a clear perception of their derivation or extent.

Department of Naval Architecture

. . . The Course for Naval Constructors has been somewhat changed, mainly following changes in the Course in Electrical Engineering, so as to take advantage of improvements in that Course. It may be noted that two classes of naval constructors have already been graduated from the Institute, and that twelve constructors now in active service have taken our Course. There are now seventeen constructors under instruction, six having been assigned to the Course this fall. In addition two private students are taking the parallel work of our Graduate Course in Naval Architecture which, like the Course for the constructors, leads to the master's degree. . . .

Department of Drawing and Descriptive Geometry.

. . . The special difficulty which the first-year class has in mastering Descriptive Geometry should again be pointed out. This difficulty appears to be due to lack of imagination on the part of the student, coupled with insufficient time for the subject and too little individual teaching. . . . Perhaps in no other subject is the want of preparation so keenly felt. The remedy appears to be an entrance examination in Projections, which might also include a requirement in elementary instrumental execution. As

bearing upon such a requirement may be quoted a recent remark of the State Agent of Drawing: "When the Institute requires an entrance examination in drawing, the demand will undoubtedly be met." . . .

Department of English

. . . During the present term an application of what may be called the laboratory method is being made to the first-year English of the first term. An hour of the time hitherto given to preparation has been added to a recitation period, to make a period of two hours. This is used for the writing of a fairly long theme in class, under the general supervision of the Instructor, the work being required within a given time. This method trains the student in readiness and promptness, and is in the end a time-saving device in that it makes impossible all dawdling, doubting, and indecision. It is too soon to speak with finality of the value of this laboratory method; but the results thus far are most promising.

In the matter of entrance examinations, the English Department has taken a new step by breaking away definitely from enforced compliance with the list of the Commission of Colleges in New England. The enthusiastic approval of this move, as expressed in letters received from the heads of fitting-schools, shows that it is at least a step in the direction in which the best thought is moving. . . .

The Medical Adviser

. . . The work of the Medical Adviser, which was begun in 1902, increased rapidly and steadily during the years 1903 and 1904 as the students became accustomed to the new arrangement and took advantage of it. . . . There is no abuse of the medical office by the students. Those who ask for advice have a definite ailment. It seems characteristic of the men that they do not waste time over imaginary ills. The practice of asking the Medical Adviser for excuses from class-work without sufficient reason which is sometimes met with in our colleges, is practically unheard of at the Institute. . . . On the other hand, occasionally a man is found, who, in his enthusiasm for work, does not take very good care of himself, neglects physical exercise, and cuts short his sleep. These mistakes in hygiene are not the necessary consequences of the Institute course, but rather the results of the student's own carelessness or poor judgment as to how to get the most out of himself. . . .

The Libraries

The number of gross accessions to the libraries of the Institute during the year 1904-05 is 4,915. The list of periodicals and other serial publications taken by the Institute has been increased during the past year by 17, making the total number now currently received 961.

The Registrar

... The Faculty Committee on Undergraduate Scholarships, at its annual meeting for the awards for the current year, entertained two hundred sixty-six applications for aid. One hundred eighty-seven awards, amounting in all to \$23,425, were made. Thirty-four of these awards were replaced wholly or in part by State aid, to total amount of \$3,950. The number who made applications for State aid and did not ask for Institute aid was fifty-seven. This makes a total of three hundred twenty-three applications for Scholarship aid. The fifteen State awards to those who received no Institute assistance, added to the one hundred eighty-seven Institute awards, gives a total number of two hundred two students who are receiving scholarship assistance. ...

EXTRACTS FROM REPORT OF THE TREASURER

For Year ending Sept. 30, 1905

The most striking feature in this year's report is the large reduction in the deficit. This has been brought about mainly by the following changes:—

There has been an increase in students' fees of about \$23,000, and at the same time a reduction in other items, in round numbers, as follows: in repairs, \$2,000; insurance, \$2,400; fuel, \$2,500; electricity, \$600; department supplies, \$21,000; and in the St. Louis Exposition account, about \$3,000.

To offset this, the salary account increased \$6,000, and there were additions to some other items, making the net result a deficit, in the current expense account for the year, of \$10,582.32, instead of \$55,405.66 for last year; a decrease of \$44,823.34. ...

The following legacies and gifts have been received:—

From the estate of Mrs. Edna Dow Cheney, \$13,741.66 as a fund for the benefit of the Margaret Cheney Reading-room. With this legacy came a portrait of Miss Margaret S. Cheney. Those who knew Miss Cheney

testify to the excellence of the likeness, and it is most appropriate that this work of art should adorn the room which is itself a memorial to her. For the Sanitary Research Laboratory Fund, \$5,000 from the same anonymous friend who has made the previous payments for this purpose. From the estate of the late George B. Upton, \$5,000. From Lucius Clapp, Esq., for scholarship purposes, stock valued at \$4,900. From the estate of Susan E. Dorr, in addition to previous amounts, \$1,790.07. From Charles G. Weld, M.D., for the Department of Naval Architecture, \$1,543.31. For the Physico-Chemical Research Fund, the trustees of the Hale Fund gave \$1,000, and Samuel Cabot, Esq., \$200. Mr. Cabot also gave \$1,000 to constitute the Cabot Medal Fund. \$1,000 were given by William W. Jacques, Ph.D., for the Physical Department, and \$500 by an anonymous friend for salaries. From Mrs. Henry Pickering \$350 were received for the Department of Topographical Geology, and Mrs. William B. Rogers contributed \$208.50 for the purchase of periodicals, the branch of the library for which she has done so much in the past. . . .

THE UNDERGRADUATES

INSTITUTE COMMITTEE

The officers for the current year are: president, M. A. Coe, '06; vice-president, J. H. Leavell, '07; secretary and treasurer, H. A. Rapelye, '08.

CONVOCATIONS

The first convocation of the year was held in Huntington Hall on November 23. Dr. Henry Van Dyke, professor of English at Princeton, gave a fine address, using as his text the story of the young men in the Book of Daniel who "would not defile themselves with the king's meat."

At the second convocation, on December 22, Dr. Booker T. Washington gave one of his characteristic, telling addresses, to a crowded audience.

PROFESSIONAL SOCIETIES

Civil Engineering Society.—The society has thus far held four regular meetings. The first one, on October 13, was addressed by Professor Swain, who took as his subject, "Why do we come to the Institute?" Professor Allen, with the subject, "The Relation of an Engineering Training to Business Life"; and Professor Porter, who spoke upon the sequence, "Adopt, Adapt, Adept." At the second meeting, November 3, Mr. H. K. Barrows, '95, now in the Hydrographic Office of the Geological Survey, spoke on "Hydrographic Work in New England."

The third meeting had as its speaker Mr. William P. Gerhard, whose topic was "Some Water Supply Problems."

The fourth meeting, on January 4, was held at the Technology Club, and was addressed by Mr. W. S. Johnson, '89, assistant engineer of the Massachusetts State Board of Health.

Mechanical Engineering Society.—At the first meeting, held at the Union on October 17, Mr. Frank B. Gilbreth gave a detailed

account of the process and machines used for mixing concrete. The meeting on October 20 was addressed by Mr. Allen, of the Harrison Foundry and Machine Company, who gave an illustrated lecture.

Mining Engineering Society.—The first meeting, held at the Union October 12, had as its speaker Mr. J. H. Batcheller, '00, who spoke on "Cyaniding of Gold Ores." The meeting of November 22 took the form of a discussion of "Summer Work." The meeting of December 13 was addressed by Professor William P. Blake, of the School of Mines, University of Arizona, upon the subject of "Education in Mining."

Architectural Society.—The regular monthly smoke talk of the society on December 4 had as its speaker Mr. R. C. Sturgis, who emphasized the importance of being able to draw rapidly and accurately.

Chemical Society.—The first meeting, on October 25, was addressed by Professor Talbot, upon the subject "How our Chemical Society can be of Use to us." The smoker of November 21 had as its speaker Dr. Henry Fay, whose topic was "The Theory and Practical Uses of High Speed Tool Steels."

Electrical Engineering Society.—At the meeting of the society on November 2 Dr. Frank B. Jewett spoke on "Some Limitations of Long Distance Telephoning."

THE CLASSES

1906.—The annual dinner of the class was held at the Union on January 3, Professors Swain and Sedgwick being the principal speakers. At this dinner the result of the class elections was announced as follows: H. C. Henrici, first marshal; C. F. W. Wetterer, second marshal; H. L. Williams, third marshal; C. T. Bartlett, L. G. Blodgett, G. W. Burpee, M. A. Coe, S. C. Coey, W. F. Englis, E. D. A. Frank, G. M. Henderson, A. W. Hertz, T. L. Hinckley, B. R. Honeyman, A. H. Keleher, W. J. Knapp, J. Lage, J. T. Lawton, Jr., M. T. Lightner, L. F. Mesmer, R. R. Patch, J. H. Polhemus, G. C. Simpson, P. B. Stanley, H. A. Terrell.

1908.—The result of the class elections is as follows: president, W. E. Weinz; vice-president, A. W. Heath; secretary, H. Webb; treasurer, W. A. Adams; Executive Committee, F. J. Friedman and B. L. Gimson; Institute Committee, G. T. Glover and H. A. Rapelye.

1909.—The result of the class elections is as follows: president, M. R. Scharff; vice-president, A. Campbell; secretary, W. W. King; treasurer, H. E. Whittaker; clerk, S. S. Bundy; directors, K. D. Godfrey, P. M. Wentworth; Institute Committee, M. Belcher, W. F. Jones.

CLUBS AND SOCIETIES

Musical Clubs.—The annual winter concert and dance was held on December 20 at the New Century Building. Over six hundred were present at the concert, and the matrons of the dance which followed were Mrs. Peter Schwamb, Mrs. Harry E. Clifford, Mrs. Arthur G. Robbins, and Mrs. Frank P. McKibben.

Technology Band.—The band this year is under the direction of C. W. Kenniston, '08, and thus far has a membership of about twelve.

Walker Club.—By the courtesy of the Technology Club the Walker Club gave a reception there, on October 27, to the graduates of other colleges at the Institute. President Pritchett, President Loring of the Walker Club, President Guy Lowell of the Technology Club, and Acting Dean Merrill made short speeches.

Civic Club.—The discussion at the meeting of November 10, held at the Tech Union, was upon "The Relative Advantages to the United States of Protection and Free Trade."

Chess Club.—It has been voted that the club join the Metropolitan Chess League.

British Empire Association.—The first dinner was held at the Union on November 15. Twenty-eight of the active members were present besides the guests of the evening, who were the three honorary members, Recorder Wells, S. Gunn, M. I. T. '05, and T. Hasejawa, '09.

Ohio Club.—The membership this year is sixteen. The officers are as follows: M. J. Gibbons, Jr., '06, president; S. R. Miller, '07,

vice-president; L. E. Stone, '06, secretary; P. S. Schmidt, '06, treasurer; and W. H. Kiefaber, '09, sergeant-at-arms.

Pennsylvania Club.—The first dinner, at which C. H. Shapleigh presided, was held at the Union, December 12.

Texas Club.—The first dinner of the year, held December 6, was attended by fifteen men.

Exeter Club.—The first dinner of the year, held at the Union, on October 13, was the occasion for initiating the Freshmen members.

Mechanic Arts High School Club.—At the meeting held January 5 this new club was established, with the following officers: E. O. Hiller, assistant in mechanical engineering, president; O. G. Fales, '07, vice-president; R. B. Weiler, '08, secretary-treasurer; W. J. Cady, '06, A. F. Stevenson, '07, H. S. Osborne, '08, and J. W. Nickerson, '09, executive committee.

Research Laboratory of Physical Chemistry.—The first annual dinner was held at the Hotel Nottingham the last week in December. Professor Ostwald, Professor Jones of Johns Hopkins University, and the instructors and students directly connected with the laboratory were present. Venison was furnished by two of the students, as the result of a hunting trip in Maine. Professors Talbot and Noyes both spoke on pertinent questions.

Sigma Xi.—The various classes have, by vote, indorsed the proposal to establish a chapter at the Institute. This fraternity holds a somewhat similar place in technological institutions to that held by the Phi Beta Kappa in colleges of arts.

Y. M. C. A.

On September 29 the Technology Y. M. C. A. gave a reception, as usual, to the Freshmen at the Tech Union, in order to introduce the young men to one another and to the various undergraduate activities.

The officers of the Tech Y. M. C. A. for this year are as follows: president, Harvey B. Orcutt, '06, Student House, 240 West Newton Street; vice-president, William Green, '06, Tech House, 138 Eustis Street, Roxbury; secretary, D. G. Robbins, '07, 68 West Rutland

Square; treasurer, W. H. Trask, Jr., '06, 237 Beacon Street; chairmen of committees: Meetings, George W. Burpee, '06, Student House; Membership, H. H. Bentley, '08, 424 Massachusetts Avenue; Bible Study, F. O. Adams, Jr., 131 Addington Road, Brookline; Settlement Work, William Green, '06, Tech House; Missionary, W. H. Medlicott, '08, 217 Newbury Street; Church Relations, J. R. Rehn, '06, 54 The Fenway; Social, P. N. Critchlow, '06, Student House; Music, K. W. Dyer, '08, Student House.

The work of the association for the coming year will include, among other things, the continuance of the activities at the Student House, 240 West Newton Street, where about fifteen of the association men live; a series of weekly meetings, on Thursdays from 1.30 to 2 P.M., on live topics of the day (led by members of the Faculty, lawyers, ministers, and business men) and courses in Bible study.

At the mass meeting held January 5 in Huntington Hall, Mr. Fred B. Smith, secretary of the International Y. M. C. A., spoke on "Profit and Loss."

TECH UNION

President Pritchett has named the following men for the House Committee of the Tech Union: Harold V. O. Coes, '06, chairman; John H. Leavell, '07; Harry Webb, '08, E. A. Hunt, '09. In view of the resignation of President Pritchett's secretary, Mr. A. LeF. Derby, which took effect on January 1, certain changes in the administration of the Union have been necessary. The Union will be under the general charge of Bursar Rand. Arrangements for smokers, class dinners, etc., will be made with Mr. Leonard T. Bushnell, in the Registrar's office. The Saturday night *Kommers* will be under the direction of the House Committee.

Early in December the plan was begun of serving medium priced lunches at the Union from twelve to two each day. This is largely to accommodate the many men at the mechanical laboratories who do not find it possible to get down to the regular lunch room.

The first *Kommers* of the winter was held on Saturday night, December 9.

One hundred and fifty men were entertained by Mrs. Pritchett at the Union Christmas evening. Mrs. Waldo Richards gave some very entertaining readings. The men then gathered about the big Christmas tree, and were presented with gifts by Mrs. Pritchett. Dr. Pritchett was prevented by illness from being present.

ATHLETICS

ATHLETIC ASSOCIATION

At the first meeting of the year, October 19, the following officers were elected: president, W. J. Knapp, '06; vice-president, J. H. Leavell, '07; secretary-treasurer, O. H. Starkweather, '07.

L. Allen, '07, assistant manager of last year's track team, was elected manager of the team for the coming year.

THE FALL HANDICAP MEET

The meeting was held on Technology Field October 28.

Summary

HIGH JUMP.—First, Very, '07, 5 ft. 9 in. (handicap 5 in.); second, Holmquist, '06, 5 ft. 7 in. (handicap, 2 in.); third, Davenport, '07, 5 ft. 6 in. (handicap, 2 in.).

MILE RUN.—First, Buckingham, '06, 30 yds.; second, Beam, '07, scratch; third, Sullivan, '09, 50 yds.

HAMMER THROW.—First, Flagg, '09, 113 ft. 9 1-2 in. (handicap 20 ft.); second, Harvey, '06, 105 ft. 2 1-2 in. (handicap, 25 ft.); third, Scharff, '09, 97 ft. 1-4 in. (handicap, 15 ft.).

SHOT PUT.—First, Harvey, '06, 38 ft. 4 1-2 in. (handicap, 4 ft.); second, Friedman, '08, 36 ft. 10 1-4 in. (handicap, 6 ft.); third, Breitzke, '06, 36 ft. 2 1-2 in. (handicap, 4 ft.); fourth, Child, '08, 35 ft. 8 3-4 in. (handicap, 1 ft.).

100-YARD DASH.—First heat: first, K. W. Richards, '07; second, Gibbons, '07. Time, 10 4-5 s. Second heat: first, Todd, '08; second, Weinz, '08. Time, 11 s. Third heat: first, E. P. Noyes, '07; second, Snow, '06. Time, 11 s. Fourth heat: Ripley, '09;

second, Steele, '08. Time, 11 s. Fifth heat: first, Richardson, '08; second, Whitaker, '09. Time, 11 s.

SEMI-FINALS.—First heat: first, Todd, '08; second, Gibbons, '06; third, Richards, '07. Time, 11 4-5 s. Second heat: first, Richardson, '08; second, Ripley, '09; third, Steele, '07. Time, 10 4-5 s. Final heat: first, Richardson, '08, 6 yds.; second, Todd, '08, 4 yds. Time, 10 3-5 s.

120-YARD HURDLES.—First, Albro, '07; second, Noyes, '07. Time, 18 s.

POLE VAULT.—First, Richardson, '08, 24 in.; second, Holmquist, '06, 12 in.; third, Very, '07, 20 in. Height, 9 ft. 2 in.

HALF-MILE RUN.—First, Gimson, '07, 30 yds.; second, Sullivan, '08, scratch; third, Swett, '07, 50 yds. Time, 2 m. 2 s.

DISCUS THROW.—First, Nisbet, '09, 116 ft. (handicap, 20 ft.); second, Harvey, '06, 103 ft. 6 1-2 in. (handicap, 15 ft.); Pierce, '08, 101 ft. 1-2 in. (handicap, 20 ft.).

BROAD JUMP.—First, Richardson, '08, 19 ft. 11 in. (handicap, 12 in.); second, Gibbons, '06, 19 ft. 1 in. (handicap, 12 in.); third, Tracy, '08, 16 ft. 2 1-2 in. (handicap, 12 in.).

220-YARD DASH.—Trial Heats. First heat: first, Gram, '09, time 22 1-5 s. Second heat: first, Allen, '09, time 22 1-5 s. Third heat: Whitaker, '09, time, 22 s.; second, Smeaton, '09. Fourth heat: first, Steel, '08, time 24 1-5 s.; second, Perry, '08. Fifth heat, first, Wellington, '08, time 25 2-5 s.; second, Pierce, '08. Sixth heat: first, Moses, '09, time 25 2-5 s.; second, White, '09. Seventh heat: first, Godfrey, '09, time 25 3-5 s.; second, Flaherty, '09. Eighth heat: first, Blackburn, '08, time 26 s.; second, Luther, '07. Final heat: first, Godfrey, '09, 9 yds. (handicap, 24 s.); second, Steel, '08, 8 yds. (handicap, 24 s.); third, Wellington, '09, 6 yds. (handicap, 24 s.).

TWO-MILE RUN.—First, Callaway, '08, 50 yds.; second, Clapp, '06, 100 yds.; third, Adams, '06, 100 yds. Time, 10 m. 17 s.

440-YARD DASH.—First, Gimson, '08, 20 yds.; second, Howe, '06, scratch; third, Ruggles, '08, 15 yds. Time, 54 1-5 s.

220-YARD LOW HURDLES.—First, Albro, '07, scratch; second, Mann, '06; third, Jones. Time, 30 s.

GOLF TOURNAMENT

The fourth annual tournament of the New England Intercollegiate Golf Association, comprising teams from Amherst, Brown, Williams, and Technology, was played October 17, on the Wollaston Golf Links. The forenoon play between Williams and Amherst resulted in favor of the former, with a total of 14 holes up; while the match between Technology and Brown came off with a victory of 15 to 11-2 in favor of Technology.

The finish in the afternoon between Technology and Williams was a closer contest. This, in addition to the other matches won by Williams, gave that team the final round over Technology, with a score of 10 to 4, and decided the tournament in favor of Williams.

FIELD DAY

The Sophomores won Field Day by a score of 5 to 4, coming out ahead in the relay race, and tying with the freshmen in the football game.

The attendance was very good, the grand stand being well filled, as were both the bleachers. Besides this there were many people who were unable to get seats.

Harvard won the Cross Country race by a score of 46 to 32. The time was eight seconds faster than the record made by Lorenz of Tech, '05, last year.

The football game, the second event, was very loosely played.

Between the halves both the relay race and the tug-of-war were run off. In the relay race the Sophomores led from the start, and had no trouble in running their last relay, being about 60 yards or more ahead.

The Freshmen took the tug-of-war in rather easy fashion. They got the drop at the start, and by steady, consistent pulling won in 45 seconds.

FIELD DAY DINNER

The dinner was given to the participants in the Field Day by the Alumni Advisory Council on Athletics at the Tech Union, Mon-

day evening, November 13. Major F. H. Briggs, '81, chairman of the Advisory Council, presided, and the guests were Bursar F. H. Rand, Coach Mahan, and Dr. J. A. Rockwell, '96, medical adviser of the track team.

CROSS COUNTRY RACE

The Institute was represented for the first time in the Intercollegiate Cross Country Association held at Traver's Island, N.Y., on November 25. The M. I. T. won fourth place, the championship going to Cornell. The following men represented the Institute: D. Adams, '06 (Captain); C. W. Beam, '07, H. R. Callaway, '08, and C. S. Clapp, '06. They were accompanied by Coach John Mahan and Manager Starkweather, '07.

M. I. T. FENCING ASSOCIATION

At the first meeting, held November 3, the following officers were elected: J. Lage, chairman; E. M. Berliner, secretary; and L. Fournon, coach.

At the annual meeting of December 27 of the Intercollegiate Fencing Association the M. I. T. was refused admission. Four of the members,—Yale, Annapolis, West Point, and Pennsylvania—voted against the Institute, while Harvard, Cornell, and Columbia voted in favor. Because of this action the representatives of the three colleges last named withdrew, and formed a new organization, called the University Fencing League, which they have invited the M. I. T. and Princeton to join.

THE GRADUATES

NOMINEES FOR MEMBERSHIP IN THE M. I. T. CORPORATION SUBMITTED TO THE VOTE OF THE ALUMNI, JANUARY, 1906

ANDREW H. RUSSELL, '68. Student in Civil Engineering, 1865-67. Lieutenant Colonel of Ordnance, U.S.A., Washington, D.C.

1871, graduated from West Point Military Academy, number four in his class. After several years' service in the United States Cavalry, he was transferred to the Ordnance Department, and has been stationed at the various prominent arsenals throughout the country, and on special duty in the inspection of mortars and their carriages. Instructor at West Point for four years in the following subjects: natural and experimental philosophy and astronomy, mineralogy and geology, and ordnance. Chief Ordnance Officer in the Philippines immediately after the Spanish War. Has published a good many papers, including articles on "Modern Military Magazine Guns," to which subject he has given special attention.

EBEN S. STEVENS, '68. Student, 1865-67. President and Treasurer Intervale Mills Corporation, Quinebaug, Conn.

Massachusetts Senator, 1892-93. Served as expert in Kettle Brook and Blackstone River case for City of Worcester, the case involving two and one-half millions of dollars. Has served on numerous public boards, and is at present interested in several public corporations.

ERNEST W. BOWDITCH, '69. Student in Civil Engineering, 1865-69. Civil Engineer, 60 Devonshire Street, Boston, Mass.

Educated in Brookline public schools and Massachusetts Institute of Technology. In 1869 was with Burlington & Missouri R.R. as axeman and assistant engineer. With the United States Darien Expedition, January to July, 1870, as assistant geologist and assistant engineer. With Shedd & Sawyer, civil engineers, October, 1870, to April, 1871 (Boston), and did the engineering work for Robert Morris Copeland, landscape gardener. Is at present engaged in professional work, mainly landscape gardening, with collateral engineering and surveying, sanitary engineering and heavy foundations.

RICHARD H. SOULE, '72. Graduate in Mechanical Engineering. Consulting Engineer (retired). 1571 Beacon Street, Brookline.

1870, graduated A.B. from Harvard. 1872, graduated from Massachusetts Institute of Technology. 1872-75, chief draughtsman and assistant superintendent Southwark Iron Works, Philadelphia. 1875-83, in Pennsylvania R.R. service, successively as draughtsman, engineer of signals, assistant engineer of tests (all at Altoona, Pa.), division superintendent of motive power at Baltimore, Md., division superintendent of motive power at Williamsport, Pa., su-

perintendent of motive power at Columbus, Ohio, 1883-85, superintendent of motive power West Shore R.R., Frankfort, N.Y. 1885-87, superintendent of motive power Erie R.R., Buffalo, N.Y. 1887-88, general manager Erie R.R., New York. 1888-91, with George Westinghouse, Pittsburg, Pa., developing and introducing the Westinghouse Friction Buffer Drawgear. 1891-97, superintendent of motive power Norfolk & Western R.R., Roanoke, Va. 1897-99, with the Baldwin Locomotive Works, Philadelphia, abroad, and at Chicago. 1901-05, consulting engineer, New York. Now retired and living at Brookline, Mass.

FREDERICK K. COPELAND, '76. Graduate in Civil Engineering.
President Sullivan Machinery Company, Railway Exchange Building, Chicago, Ill.

With the Burlington R.R. in Iowa, 1876-78, in the freight and operating department. 1880-84, with the White Breast Fuel Company, Iowa, as mechanical engineer and superintendent. 1884-93, with the Diamond Prospecting Company, Chicago, as general agent, vice-president, secretary, treasurer, and president. 1892 to the present time, president of Sullivan Machinery Company, manufacturers of mining and quarrying machinery.

CHARLES T. MAIN, '76. Graduate in Mechanical Engineering.
Of Dean & Main, Mill Engineers and Architects, 53 State Street, Boston, Mass.

Three years assistant at Massachusetts Institute of Technology in mechanical engineering. One and one-half years draughtsman at Manchester Mills, Manchester, N.H. Five years engineer Lower Pacific Mills, Lawrence, Mass. One year assistant superintendent Lower Pacific Mills. Five years superintendent Lower Pacific Mills. Since 1892 has been engaged in mill engineering, and in consultation on many power plants, both steam and hydraulic. Has served the Alumni Association as member of the Executive Committee, as vice-president, and as president.

JOSEPH P. GRAY, '77. Graduate in Civil Engineering. Vice-President Boston Manufacturers' Mutual Fire Insurance Company, 31 Milk Street, Boston, Mass.

For some years after graduation was in general engineering practice in connection with private and government work. Was assistant engineer with the Locks & Canals Company at Lowell from 1880 until 1891, since which time he has been connected with the Boston Manufacturers' Mutual Fire Insurance Company as engineer, as assistant to the president, and as vice-president, which office he still holds.

FREDERICK W. WOOD, '77. Graduate in Mining Engineering.
President Maryland Steel Company, Sparrow's Point, Md.

At the Massachusetts Institute of Technology, 1877-78, as assistant in the Chemical Laboratory, and in the Mining and Metallurgical Laboratory. In 1878 entered the Open Hearth Steel Department of the Pennsylvania Steel Company, and served with that company until 1891 as superintendent of blast furnaces, and as assistant superintendent, superintendent,

general manager, and vice-president of the company, which position he still holds. Was elected president of the Maryland Steel Company in 1891.

THOMAS C. DU PONT, '84. Special Student in Mining Engineering. Wilmington, Del.

President du Pont Powder Company. President Central Coal and Iron Company. President Main Jellico Mountain Coal Company. President McHenry Coal Company.

ISAAC W. LITCHFIELD, '85. Student in Electrical Engineering, 1882-84. Assistant General Manager Lamson Consolidated Store Service Company, 161 Devonshire Street, Boston.

1889-94, editor and part owner *Warwick Valley Dispatch*, Warwick, N.Y. 1894-1902, with Deering Harvester Company, Chicago, first as advertising manager, and later as assistant to the manager of manufacturing. 1902-04, general manager Acme Harvester Company, Peoria, Ill. 1904, assumed his present position. President North-western Association, Massachusetts Institute of Technology, 1899, 1900, 1901.

FREDERICK H. NEWELL, '85. Graduate in Mining Engineering. Chief Engineer Reclamation Service, United States Geological Survey, Washington, D.C.

1886-87, graduate student, Massachusetts Institute of Technology. 1888-90, with United States Arid Land Survey. 1890-1903, chief hydrographer United States Geological Survey. 1903, appointed to his present position. 1903, president Alumni Association, Massachusetts Institute of Technology.

FRANK L. LOCKE, '86. Graduate in Civil Engineering. Superintendent of Factories, Boston Rubber Shoe Co., Malden, Mass.

1887-95, in Engineering Department, city of Boston. 1895, with Boston Rubber Shoe Company, as assistant superintendent, until 1902, when he was appointed to his present position. He has served two years on the Executive Committee of the Alumni Association, and as President of the Alumni Association in 1905. He served in the Militia of Massachusetts for fourteen years, and for the last three years of this service was colonel and assistant inspector general.

HENRY SOUTHER, '87. Graduate in Mining Engineering. President and Treasurer The Henry Souther Engineering Company, 440 Capitol Avenue, Hartford, Conn.

1887-88, studying in Germany for eight months. 1888-93, with Pennsylvania Steel Company as foreman of Bessemer Department, and later in particular charge of the manufacture of special steels. 1893-99, expert and metallurgist in charge of testing laboratory for Pope Manufacturing Company. 1899-1903, consulting engineer and metallurgist in Hartford, having leased the laboratory which he had built for the Pope Manufacturing Company. 1903.

organized the Henry Souther Engineering Company to carry on his engineering business. He is also at present State chemist of Connecticut.

CHARLES NEAVE, A.M., '90. Graduated from Yale University in 1888 and Massachusetts Institute of Technology in Electrical Engineering. Member of the firm of Richardson, Herrick & Neave, 80 Broadway, New York City.

After leaving the Institute, he worked as electrical expert in the shops of the Thomson Electric Welding Company in Lynn. He then studied for two years at Harvard Law School, and received the degree of A.M. from Harvard University. He entered the law office of Fish, Richardson & Storrow in 1893, and in 1895 became a member of the present firm, successors to the above firm, and moved his office to New York.

LEONARD METCALF, '92. Graduate in Civil Engineering. Consulting Civil Engineer, 14 Beacon Street, Boston.

Upon graduating, he was associated with Messrs. Wheeler and Park, consulting civil engineers of Boston, who were owners and managers of water works, and for three years he acted as resident engineer for them, in charge of engineering construction in various parts of the United States. From 1895 to 1897 he was Professor of Mathematics and Engineering at the Massachusetts Agricultural College, and meteorologist of the Hatch Experiment Station. 1897 to date, in private practice as consulting civil engineer, designing and supervising construction of water works, sewerage, and manufacturing waste disposal plants, as well as treasurer and manager of several water and electric light plants in the Middle West.

FRANCIS WALKER, A.M., Ph. D., '92. Graduate in General Course. Department of Commerce and Labor, Bureau of Corporations, Washington, D.C.

He is the third son of the late President Francis A. Walker. In 1893 he received the degree of A.M., and in 1895 the degree of Ph.D. from Columbia University. In 1897 he was appointed Professor of Political Economy in Colorado College. In 1900 he accepted the appointment of Professor of Political and Social Science in Western Reserve University, resigning in 1902. After studying for about a year in the Universities of Munich, Vienna, and Berlin, he was appointed in the beginning of 1904 as special examiner in the Bureau of Corporations in the Department of Commerce and Labor at Washington. Has published numerous articles on political economy.

ALBERT F. BEMIS, '93. Graduate in Civil Engineering. Secretary Bemis Brother Bag Company. President Jackson Fibre Company, Jackson, Tenn. 89 State Street, Boston, Mass.

Since graduating, has been closely connected with the development of the business of the Bemis Brother Bag Company, which manufactures all kinds of cloth sacks, operating or controlling in various parts of the United States ten factories, two cotton mills, and a bleachery. He was first secretary of Walker Memorial Gymnasium Committee.

FRANCIS C. GREEN, '95. Graduate in Sanitary Engineering. General Manager Consolidated Car-heating Company, 42 Broadway, New York.

From 1895 to 1897 he was with Mr. Rudolph Hering, consulting engineer. He then went to Nicaragua as assistant engineer with the Nicaragua Canal Commission. Upon his return to the United States in 1898, he passed the examinations of the United States Navy, and was recommended for appointment as lieutenant, junior grade. In January, 1900, he was appointed general superintendent of the Consolidated Car-heating Company, and in June of 1902 became general manager, which position he now holds.

ASSOCIATION OF CLASS SECRETARIES

The ninth annual meeting of the Association of Class Secretaries was held at the Technology Club on Tuesday evening, Nov. 21, 1905, thirty-three secretaries and representatives and four guests being present. At the business meeting, which followed the usual dinner, Professor Robert H. Richards, '68, was chosen chairman for the evening, and annual reports were presented by the secretary, the Committee on Publication of the TECHNOLOGY REVIEW, the Committee on Closer Relations among Graduate Organizations, the Committee of the Association on the Technology-Harvard Alliance, and the 1905 Commencement Celebration Committee.

The report of the Committee on Publication was in part as follows:—

“A part of the year just closed was a very strenuous time for the Publication Committee of the REVIEW, as that periodical was made, by the Executive Committee of the Alumni Association, the official means of bringing the question of the proposed alliance with Harvard before the whole alumni body. This commission, among other things, involved the preparation and sending to all Institute men available of an extra number containing 231 pages, the proofs of which had to be submitted to a number of individuals and committees, and the printing of which had to be done within the space of about one week. This meant Sunday and night work at the printing-office as well as on the part of the authors and others responsible for the preparation of the matter.

The final cost of this extra number was \$2,200.94, but the greater

part of this large sum was guaranteed by the M. I. T. A. A. Executive Committee, who asked and obtained substantial aid from the Executive Committee of the Corporation. The REVIEW assumed only so much of the expense as was represented by the estimated saving on the issues for July and October, which were made smaller than usual. The many important topics of last winter had rendered the January and April numbers, however, very large, so that the total number of pages in Volume VII. (including the extra Alliance number) is 713. This is seventy-five pages more than Volume VI. (itself of extraordinary size), and is two hundred pages larger than Volume IV., which may fairly be taken as a standard for the REVIEW."

During the preceding year the Association held four meetings: the eighth annual meeting Nov. 15, 1904, and special meetings, Dec. 2, 1904, March 16, and May 12, 1905. The subject receiving most consideration by the Association during the year was the proposed alliance of the Institute with Harvard University. At the annual meeting in November, 1904, the Association's Committee on the Alliance reported a method of procedure to be followed in case the plan of affiliation with Harvard were referred to the alumni for expression of alumni opinion. The committee's suggestion was adopted by the class secretaries, and by unanimous vote it was recommended to the Executive Committee of the Alumni Association. By the latter it was adopted and announced to the alumni body in December, and in due time the plan of procedure was carried out in full. The Association's Alliance Committee was continued for the year 1904-05, during which time its work, as carried on by the secretary, consisted mainly of keeping representative alumni in distant places informed of developments in the merger question. A complete collection of newspaper clippings concerning this question has been made as a matter of permanent record. All expenses of the committee were met by special contributions. The need of its existence being at an end, the committee was discharged at the meeting of November, 1905. At the special meeting Dec. 2, 1904, the relations of the Institute with Harvard were the sole topic of discussion.

Through a Commencement Celebration Committee, appointed at the March meeting, the Association undertook, with success, the management of the 1905 commencement celebration, and the meeting in May was called to consider plans for that event.

The most important work conducted by the Association is the publication of the TECHNOLOGY REVIEW, and the March meeting was devoted principally to a consideration of questions affecting the future of the magazine.

At the suggestion of the Technology Club of the Merrimack Valley the Association has recommended the adoption by local alumni organizations of a uniform membership card which shall entitle the holder to visitor's privileges in all such organizations. The Committee on Closer Relations has undertaken to secure the general adoption of such a card.

In order to insure proper permanent organization in the undergraduate classes, the Association co-operates each year with the Registrar of the Institute in the preparation of a card catalogue of each entering class. These catalogues are kept in the Dean's office at the Institute, in the custody of the secretaries of the respective classes. By annually making note of changes in membership, each class, at graduation, has a complete catalogue of its members upon which its work as a permanent organization may be based.

At the annual meeting in 1904 the Association adopted a systematic plan of raising revenue by which each class is asked to make a contribution to the Association once in five years, the amount of the payment to be determined by the number of its living graduates and the number of years the class has been out of the Institute, no payment being requested until five years after graduation. Financially, the Association is in prosperous condition, for in addition to class contributions it has received from the Commencement Celebration Committee \$371.95 as the net proceeds of the 1905 commencement celebration, due to the admirable management of the Pop Concert.

Upon completing the routine business of the November 21st meeting, the remainder of the evening was devoted to an interesting, informal discussion of alumni questions brought up by President

Frank L. Locke, '86, of the Alumni Association, and by other members of the Alumni Association's Executive Committee.

FREDERIC H. FAY, '93,
Secretary.

THE WASHINGTON SOCIETY OF THE M. I. T.

Our society has, during the past year, carried out regularly the plan which was inaugurated the year before, and has held informal dinners and smokers twice a month at the society's home, the University Club. The club, started within two years, largely through the efforts of our society, has established an enviable reputation for its excellent *cuisine* at moderate prices and its other attractions as a place for college alumni meetings, and the frequent contact with other college men incidental to our meetings has proved desirable rather than otherwise. The meetings have been announced by postal notices to members, and were continued throughout the summer, though many of the Washington Tech men leave the city for field work during a part of the year. It is intended to make these semi-monthly dinners a permanent institution, and any Tech men visiting in Washington may look for a welcome at the University Club, 16th and K Streets, on the second and fourth Mondays of the month at six o'clock.

The annual dinner of the society was held at the Hotel Cochran on December 14, with about forty men present. Marshall O. Leighton, '96, served as an efficient toastmaster.

The principal toast was that responded to by President Pritchett, "The President of the Institute." He urged that our earnest attention as Tech alumni be given to aiding in the solution of the problems confronting the administration of the Institute, as now defined by the recent decision to remain at the present location in Boston and independent of any other institution. He pointed out two different courses of educational policy that are open to the Institute, either to emphasize the work of undergraduate instruction or to build up primarily a graduate school with undergraduate courses. He stated as a fact of modern educational development

that in order to make a trial of a new idea in education, it is almost necessary to start a new school, while in the business world it is the old established and influential concerns that try the most experiments. This led up to the question of whether or not a change in the manner of administration would be desirable, to give a degree of autonomy to the various courses and make of each practically a separate school of engineering. Various other questions affecting the future of the Institute were also touched on by the President in his address.

He was followed by Proctor L. Dougherty, '97, whose toast was "Reconstruction." Mr. Dougherty traced the activity of the alumni in the welfare of the Institute as shown in the many alumni associations, the Graduate Athletic Council, and the subscriptions to the Walker Memorial Gymnasium and the Technology Fund, and argued that the alumni should have recognition in the Corporation. After referring to the fact that this society was the first of the alumni bodies to welcome President Pritchett after his election, he said it was the first to wish him God-speed in the event of his leaving the Institute to accept the presidency of the Carnegie Foundation.

"The Recompense of a Public Servant" was responded to by Mr. Frederick Haynes Newell, '85, director of the Reclamation Service. He spoke about the dignity of public service. The remuneration of public servants is generally lower than in private life, but there is less chance for making colossal failures. The wages a man receives generally run a little below the real value of his services. Young men entering the government service must learn from the older men: if they are not bumptious, they will advance more rapidly. Mr. Newell advocated the retirement on pensions of the aged and infirm government employees.

The officers elected for the coming year are: William J. Rich, '84, president; Francis Walker, '92, vice-president; Frederick W. Swanton, '90, secretary; Edwin F. Allbright, '04, treasurer; Albert S. Merrill, '00, director.

F. W. SWANTON, '90, *Secretary*.
1641 13th Street, N.W., Washington, D.C.

THE M. I. T. CLUB OF CINCINNATI

The Technology Club was much gratified to have at lunch one day, early in December, Mr. C. L. Auer, who has been spending the last few years at Pedroceno, Durango, Mex.

The American Smelting and Refining Company has a \$10,000,000 plant there, and are just completing a \$2,000,000 smelter, the largest in the world. There are eight M. I. T. men in the town.

S. H. PUGH, '97, *Secretary*,
1912 Madison Road, Cincinnati, Ohio.

THE TECHNOLOGY CLUB OF NEW BEDFORD

The Technology Club of New Bedford held its annual meeting on Thursday, the 2d of November. Charles R. Allen was elected president, Charles F. Wing, Jr., secretary and treasurer, and Charles F. Lawton, with the officers, executive committee. The club is lusty and growing, and we expect a season of pleasant meetings. There are now twenty members, with prospect of more to come.

The annual dinner was held on Wednesday, the 22d of November, at the house of Mr. Theodore F. Tillinghast. President Pritchett was present, and entertained the members with a short address on present and future conditions at Tech. There were sixteen present at the dinner, which went off with great *éclat*.

One of our members, Mr. E. G. Taber, '77, we have just heard from in Spokane, Wash., where he is connected with the Spokane International Railroad. He writes that he has several Tech men working with him.

CHARLES F. WING, JR., '99, *Secretary*,
34 Purchase Street, New Bedford, Mass.

THE TECHNOLOGY CLUB OF HARTFORD, CONN.

The following is from the *Hartford Courant* of December 4, 1905:—

The Technology Club of Hartford, composed of former students at the Massachusetts Institute of Technology, Boston, held its fourth meeting

Saturday evening at the rathskeller of the Hotel Heublein, President Charles Pettee presiding. Seven new members were elected, giving the club a membership of about thirty-five, all living in Hartford and vicinity. After Commissioner Henry Souther spoke on the future of the club, explaining how it could be made of benefit, not only to its members, but to the public, by giving lectures and debating the scientific problems which frequently come before the city departments, there were remarks by others, and the business meeting adjourned, to be followed by an oyster roast. Those present not already named were Vice-President H. H. Burdick, secretary; George W. Baker, Charles R. Nason, Henry Fiske, A. L. Whitmarsh, Clarence E. Whitney, Charles T. Lincoln, H. H. Ensworth, Charles F. Barrett, G. A. Shaw, P. M. Arnold, E. K. Lorenz, A. M. Holcombe, D. A. Richardson, S. E. Horton, R. B. Babson, Frederick C. Moore, William H. Beers.

The club will hold probably a half-dozen more meetings this season, and a committee appointed last night will look up permanent quarters. At the next meeting, which is expected to be held within a month, some scientific question pertaining to the city will be debated. The standing committee to select subjects and speakers, which was chosen last evening, consists of Mr. Souther, Mr. Lincoln, the president, and the secretary. The club proposes to have a number of speakers from out of town, and to have their addresses followed by discussion of the subjects upon which they speak.

THE ASSOCIATION OF WOMEN OF THE M. I. T.

The annual meeting of the Technology Women's Association was held at the Margaret Cheney Room on Saturday afternoon, January 6, with a good attendance. Professor Wilhelm Ostwald was the special guest of the association, and gave a very interesting address on the new universal language "Esperanto."

THE TECHNOLOGY CLUB

At the annual meeting of the Technology Club held on Tuesday evening, October 17, the following officers were elected: Guy Lowell, '94, president; Francis H. Williams, '73, vice-president; Leonard T. Bushnell, '05, secretary; Augustus H. Gill, '84, treasurer; and to the Council for three years, A. F. Bemis, '93, H. E. Clifford, '86,

S. K. Humphrey, '97, F. L. Locke, '86, E. C. Miller, '79. Following the business meeting a smoke talk was given by Mr. C. Howard Walker on "Municipal Improvement." The second entertainment was ladies' night, and a beautifully illustrated talk was given on "Thoreau's Country" by Mr. Herbert W. Gleason. Other interesting talks have been given, by Mr. George W. Anderson on "Public Franchises and Municipal Ownership" and by Mr. W. W. Thompson on "Historic American Yachts." On Monday, December 18, the club had the pleasure of listening to a talk by Dr. Wilhelm Ostwald on the international language, "Esperanto." Considerable interest was manifested, and a club for the study of Esperanto has been formed. The club was used October 27 for the Walker Club Reception to College Graduates, and has also been used by the Instructors' Club and the Civil Engineering Society.

LEONARD T. BUSHNELL, '05, *Secretary*,
83 Newbury Street, Boston.

NEWS FROM THE CLASSES.

1868.

PROF. ROBERT H. RICHARDS, *Sec.*, Mass. Inst. of Technology,
Boston.

Ellery Appleton writes:—

I am employed by this company [Ozan Lumber Company of Prescott, Ark.] to locate and build spur lines for their railroad, the Prescott & North-western, for getting lumber, they owning large tracts of land in this section.

In spite of the general prosperity of the country, this part of Arkansas is pretty badly off this year, with the floods in the early part of the season washing out the newly planted crops, many farmers, after planting three times, having nothing to show for it now. This was followed by the yellow fever scare; and, although there was no fever here, this part of the State was strictly quarantined, which effectually cut off the intercourse with the outside world, and reduced us to the position of trying to make a living out of a hotel where there was no business. So we had to study on living on as little as possible ourselves, and yet be prepared to furnish a good meal to a possible traveller.

—James P. Tolman writes that since his return from Italy last spring he has been very closely occupied with extensions at their mill.—J. B. Duncklee says:—

I do not know whether I have ever mentioned to you that my principal work under the United States Engineer Department at Washington was the resident charge of the "Potomac River Improvement," an extensive work of reclamation on the water front of Washington, by which some 620 acres of marshes and flats, subject to tidal overflow, were reclaimed by the dredging and deposit of some 11,000,000 cubic yards of material from the navigation channels of the river, forming the public reservation now known as "Potomac Park." The work was done chiefly with hydraulic dredges. The cost of the work was about \$2,200,000, while a conservative estimate

of the value of the reclaimed land was \$6,500,000, being one of the few instances where the United States has made a profit on a public work.

It was because I had specialized for so many years on reclamation that I was consulted in reference to the electric dredge, which promises most efficient and profitable results on the field which exists about New York Harbor. Here we would be satisfied with a profit of \$500 per acre.

—Bryant P. Tilden writes:—

In September, 1903, I went on a locating scheme for the Grand Trunk Pacific Railroad in the Canadian north-west. During the following summer I was acting engineer for my home town, took charge of the construction of three miles of pipe sewers, and was elected county surveyor. Last spring accepted position in charge of surveys in North Dakota for the United States government, and also acting city engineer of Bismarck, N.D. Just at present I am acting as consulting and locating engineer for railroad schemes in Florida.

—Stuart M. Buck has been doing reporting work, spending some time in the Clinch Valley Coal Field and also in Central Tennessee, has examined a pyrites mine in Virginia, and has been overseeing the development of a Virginia soapstone quarry. He has also had charge of a Joplin zinc mine.—Eben S. Stevens was laid up with rheumatism for ten weeks during the summer, and has since been employed in picking up the threads of his business.—Albert F. Hall has been devoting himself strictly to business, and has had no vacation in over three years.—Walter H. Sears writes that he has been on the New York water works all the year, a part of the time at Katonah, N.Y., where the commission is starting on some new work in the way of a big storage reservoir, and the rest of the time in the New York office. He made the investigations which have resulted in the adoption of the Catskills for a new source of water supply for the city.—Whitney Conant has completed the work in which he has been engaged, that of the construction of the Jersey City water-works, but the works have not yet been transferred to the city. He has made several trips to the Middle West, where he is interested in water and electric light companies.—Eli Forbes writes that he made a trip to California by way of Portland, Ore., this summer.

This past summer completes his thirty-sixth year of continuous service with the Lancaster Mills.—Robert H. Richards spent two and a half months in Oregon at the Lewis and Clark Fair, on the United States Geological Survey, studying the black sands of the Pacific coast. Beach sands from Columbia River, from the Oregon sea-coast, and clean-up sands from gold dredges and hydraulic plants were studied, as well as tailings from hydraulic plants. After a good deal of experimenting, the process adopted by Henry E. Wood, of Denver, was found to be most efficient. The sand is at first concentrated on a Wilfley table, the concentrates are dried, and then given five passes under a Wetherill magnet, increasing the magnetic power with each pass, yielding, in the order of the passes, magnetite, chromite, or ilmenite, garnet, hypersthene, monazite, and finally zircon left behind. These minerals have commercial value, and may increase the value of the sands from five to twenty times what they are worth for the small amount of gold and platinum they contain.

The chromite is used for chrome colors and chrome steel, the garnet is an abrasive, the monazite (phosphase of thorium) and the zircon (silicate of zirconia) are both used in the manufacture of Welsbach light mantles. To utilize the magnetite, a little electric furnace has been installed, which will make 200 pounds of steel in an hour and a half, using 1,000 amperes and 55 volts, and the rough preliminary cost figures for this operation indicate profit even on an experimental scale, provided the quality of the steel can be gained and controlled.

1874.

CHARLES F. READ, *Sec.*, Old State House, Boston, Mass.

The thirty-second annual reunion of the class association was held at the Technology Club, Boston, on the evening of December 30. The following eleven members were present: Messrs. Barrus, E. L. Brown, Chase, G. T. Elliot, Mansfield, Nickerson, Read, Robinson, Russ, Silsbee, and Warren. The following officers were elected to serve during the year 1906: president, George H. Barrus;

vice-presidents, John C. Chase and Charles C. R. Fish; and secretary and treasurer, Charles F. Read.—Edward S. Shaw is to be consulting engineer for Harriman Brothers, engineers of Boston, who are to build for private parties a light-house on Diamond Shoals, off Cape Hatteras. If the light-house is a success after a test of five years, the United States government will purchase it for the sum of seven hundred and fifty thousand dollars. The project was described at length in the Boston papers of Dec. 30, 1905.—William T. Blunt, member American Society Civil Engineers, who has been connected with government service the greater part of the time since 1879, and has been assistant engineer upon the harbor works in the Cleveland district on Lake Erie since 1886, has been given an indefinite furlough, and will enter contract work at Boston, with George H. Breymann & Bros., on Jan. 1, 1906.

1875.

E. A. W. HAMMATT, *Sec.*, 10 Neponset Block, Hyde Park, Mass.

During the summer I received a letter from W. H. Shockley, who wished to be remembered to all '75 men. The memorandum of his journeys occupied about one and one-half closely typewritten pages. Shockley has not only been rocked in the cradle of the deep, but in that of the desert, as on one of his trips he made a camel journey of 1,200 miles. At the time of writing he said he was thinking of again going to Bogoslovsk, in the Ural Mountains. Judging from the recent accounts in the papers, it would seem as though Russia would be a good place to keep away from for a time at least.—On Sept. 27, 1905, Henry Simonds, of Lexington, was married to Edith R. Durham, of Belmont. They are living in Winchester this winter.—A few days ago I received a pleasant letter from Cabot. John has retired from the active practice of medicine, and is enjoying life at his home in Weekawken, N.J., or in travelling with his wife.—I should be greatly obliged to any one who would send me one or more of the following numbers of the *Spectrum*, viz.: No. 8 of Vol. I.; Nos. 4 and 5 of Vol. II.; Nos. 3, 5, 6, 7, 8, of Vol. III.

1877.

RICHARD A. HALE, *Sec.*, Lawrence, Mass.

Frank E. Peabody has been elected a director of the Boston Elevated Railway Co. in place of his father, recently deceased.—W. E. Chamberlin has designed and built a new savings-bank building, which is a model of convenience and architectural beauty, in Cambridge. It is gratifying to know that his ill-health does not entirely prohibit his professional work.—F. W. Wood has a son in the Freshman Class at the M. I. T. the present year.

1878.

LINWOOD O. TOWNE, *Sec.*, Haverhill, Mass.

The class has the unique honor of one of its members being elected Lieutenant-Governor of Massachusetts. Mr. Eben S. Draper, after an exciting campaign, was elected to that office on the ticket with General Curtis Guild, Jr., as Governor. The Democratic candidate for lieutenant-governor was Henry M. Whitney, and the contest was mainly upon the question of reciprocity.

1882.

WALTER B. SNOW, *Sec.*, 29 Russell Avenue, Watertown, Mass.

The following is from the *American Carpenter and Builder* for December, 1905:—

Frank E. Kidder, the great architect and author, and one of our most valued editors, died October 27, at Denver, Col., in his forty-sixth year. The death of Mr. Kidder leaves a break in the ranks of the architects of this country which will be hard to fill, as he was looked upon as a leading authority. He was born in Bangor, Me., in 1859. At the age of twenty he graduated as a civil engineer at Maine State College. Later he studied architecture at Cornell University and at the Massachusetts Institute of

Technology, where at the same time he also delivered lectures. He later established himself in practice in Boston, but, owing to ill-health, was obliged to seek a healthier climate, and in 1888 moved to Denver, Col. Mr. Kidder soon became an authority on all forms of building construction, and most of his work was done as consulting architect. He was distinguished at the author of "Architects' and Builders' Pocketbook," "Churches and Chapels," "Building Construction and Superintendence," and "Strength of Beams, Floors, and Roofs." He was an earnest church worker, and took particular interest in designing churches.

At the annual meeting and tenth anniversary of the Foundrymen's Club, held on Thursday, January 11, Walter B. Snow was elected president. This club is composed of 118 concerns scattered throughout New England.—From the Chicago *Record-Herald* of Dec. 13, 1905:—

State Architect W. C. Zimmerman, who made an appeal for "The City Beautiful" in connection with plans for public improvements at the Illinois State capitol at a mass meeting held at Springfield last night, has been identified with the building of many of the most imposing structures in Chicago, where he has resided for twenty-five years. He attended the Boston Institute of Technology. While associated with the firm of Burnham & Root, he assisted in the architectural work of the World's Columbian Exposition. At the time of his appointment as State architect by Governor Deneen, he was architect for the Lewis Institute. He was a member of the Architectural State Board of Examiners during the Tanner administration, and is president of Illinois Chapter of the American Institute of Architects.

1883.

HARVEY S. CHASE, *Sec.*, 27 State Street, Boston.

The secretary regrets to report that George H. Gustin has been attacked with what is apparently an incurable disease. As previous class circulars have stated, Mr. Franklin B. Richards, of M. A. Hanna Company, Cleveland, would be glad to correspond with members of the class regarding him.—H. S. Chase has been appointed a member of the Executive Committee of the American

Association of Public Accountants as representative of the New England States. The Executive Committee consists of seven members, and acts for some eighteen State associations of accountants in various parts of the country. This national organization has a membership of between five and six hundred men, who are making a profession of public accountancy.—Mr. and Mrs. Horace B. Gale are at home, Trinity Court, Dartmouth Street, Boston.

1884.

PROF. WILLIAM L. PUFFER, *Sec.*, Mass. Inst. of Technology, Boston.

In a letter to Gill, under date of November 21, Boardman announces that he has left the Aspinook Company for a position in which he has charge of the Waldrich Bleachery, Worthen & Aldrich Company, Delawanna, N.J.—Our class will hereafter shine by reason of the honors received by Rotch from the Emperor William, who has bestowed upon our classmate the Order of the Red Eagle of the third class. The Order of the Red Eagle is a Prussian order founded in 1734, and in 1791 was raised to the rank of second in the monarchy. The badge consists of a white Maltese cross, with red eagles between the arms, in the centre of a golden plaque, with the cipher "F. W. R." and the motto "Sincere et Constanter." The ribbon is white, with two orange stripes.—Through the kindness of one of the class our records have been enriched by a number of photographs of ourselves as we looked at time of graduation, and your secretary wishes that he could get past and present photographs of all members of the class, and that he could be authorized to incorporate them in the next class directory.—William J. Rich has recently been elected president of the Maine Association of Washington, D.C., composed of former residents of the Pine Tree State. He has also just been elected president of the Washington Society of the M. I. T.—T. S. Mead has recently been elected president of the Boston Fruit and Produce Exchange.

1885.

I. W. LITCHFIELD, *Sec.*, 161 Devonshire Street, Boston.

The class of '85 will dine at the University Club, Boston, Saturday evening, February 3. Fred Kimball has prepared lantern slides of a number of photographs taken at Camp Walker last summer, and will exhibit them at that time.—'85 is to be congratulated on the election of Everett Morss to the presidency of the Alumni Association. No man has put in more telling work on the Walker Memorial or Technology Funds, and, besides raising money, he has given his influence and efforts in season and out of season to the Institute.—Ed. Dewson has migrated from Pittsburg, and is now resident engineer for the Westinghouse Brake Companies in New York City. His residence address is 15 West 88th Street.—C. W. Eaton is president of the Standard Dredging Company, and at present is located at "The Mount Royal," Baltimore, Md. He has taken an \$800,000 contract for deepening the channel at Baltimore. He is still a director in the National Dredging Company, of which he was formerly vice-president.—Frederick H. Newell, '85, is credited with being the founder of the recently organized Washington Society of Engineers, and has been elected one of its directors.

1887.

EDWARD G. THOMAS, *Sec.*, 161 Devonshire Street, Boston.

Twombly has joined the forces of Westinghouse, Church, Kerr & Co. in New York, and may be found at 10 Bridge Street. All projects submitted to the company are handed to him for a preliminary report, involving investigation on the spot of feasibility and cost. It is evident that his thorough experience in the use of water, steam, and electric power will be of very great service to the company.—The Secretary has been transferred to the Boston office of the Lamson Consolidated Store Service Company at 161 Devonshire Street, to assist in the development of a department for the manufacture of

special conveyors and pneumatic machinery.—Fred Thompson has been assigned to the Charlestown Navy Yard, where he has in charge the buildings, yard, and docks.—Lane was active on the side of good government in the recent municipal campaign in Boston.—Maurice Cooley has just returned from Trinidad to enjoy a well-earned vacation after three years spent in managing the asphalt properties on that island and in Venezuela. He will next undertake the development of the street railways of Uintah, Utah, and has already started for this new work.—H. C. Spaulding will be pleased to see his friends at 39 Cortlandt Street, where he is assistant sales manager for the Triumph Electric Company.—Gelett Burgess will have published this spring a book entitled “A Little Sister of Destiny” (Houghton, Mifflin & Co.), consisting of a series of stories whose heroine is a California millionaire girl in New York. Several of these tales have already appeared in the *Ladies’ Home Journal*. There, unfortunately, the hero was forced to end his call on the heroine at ten o’clock, owing to the editor’s consideration for the etiquette of the Middle West. In the book, however, Burgess promises that the hero will stay later.—H. J. Conant is now in Jamaica on a trip in search of good health. He proposes to go to Europe later, and will spend nearly a year away from business.

1888.

WILLIAM G. SNOW, *Sec.*, 1106 Penn Mutual Bldg., Boston.

The secretary has been so busy, owing to relocating in Boston, that he has not been able to get much class news. He has been for five years in Philadelphia, but is now manager of the New England office of Warren Webster & Co., Camden, N.J. His home address is 69 Pelham Street, Newton Centre.—B. R. T. Collins has been conducting an elaborate series of tests on a 500 kw. Westinghouse steam turbine in the Indian Street plant of the Savannah Electric Company. He has been assisted by Messrs. Isenberg and Lage, of the Senior Class at the Institute, who will use this work as the basis of their graduating theses.—B. G. Buttolph and William G. Snow

were present at the New York meeting of the American Society of Mechanical Engineers.—The following is quoted from the *Electrical World* of Dec. 9, 1905:—

At the annual meeting of the National Conference on Standard Electric Rules, held in the Auditorium of the New York Edison Company on Monday, December 4, Mr. W. H. Blood, Jr., was elected president, and Mr. C. J. Woodbury secretary-treasurer. . . . The new constitution provides that a yearly meeting of the conference shall be held, contemporaneous with the meeting of the Underwriters' National Electric Association. The list of societies forming the present National Conference on Standard Electrical Rules is as follows: American Institute of Electrical Engineers, American Society of Mechanical Engineers, American Street and Interurban Railway Association, American Institute of Architects, American Institute of Mining Engineers, Associated Factory Mutual Insurance Companies, Association of Edison Illuminating Companies, National Association of Fire Engineers, National Board of Fire Underwriters, National Electric Light Association, Underwriters' National Electric Association, National Contractors' Association, International Association of Municipal Electricians. These societies alone may vote on changes and recommendations to the Underwriters' National Electrical Code. Associate members are made up of corporate interests, such as the American Telephone & Telegraph Company, Western Union Telegraph Company, Postal Telegraph Company, General Electric Company, Westinghouse Electric and Manufacturing Company.

—Sumner B. Merrick is located in the Farmers' Bank Building, Pittsburg, Pa. He is interested in gold mines at Silver Bow, Nev.

1889.

PROF. F. A. LAWS, *Sec.*, Mass. Inst. of Technology, Boston.

Eugene E. Peirce writes from the office of the Harbor and Land Commission, as follows:—

We have completed the survey of the group of towns lying between Worcester and the Connecticut line, and I am now housed for the winter in our office at the State House.

In the early spring we shall begin the survey of the boundary line be-

tween Connecticut and Massachusetts. Mr. Buck, who until recently was the assistant city engineer of Hartford, will represent the State of Connecticut, and your humble servant will act in the same capacity for Massachusetts. This will be a very interesting piece of work, as it is some ninety-three (93) miles in length. We shall chain the entire line, and make a stadia survey, covering the area on either side of the line for a distance of about five hundred (500) feet, and later will mark the boundary with substantial granite monuments, as we have all of our other State lines.

—Henry Howard is chairman of the Regatta Committee of the Eastern Yacht Club, also of the Motor Boat Race Committee of the Eastern Yacht Club. We have before us the reports of the committees, and note that the treatment of the subject of motor boats is such that the data derived from the results of the various races will be of use to designers of high-speed craft of this general description. There are numerous photographs showing the wave formation of boats differing widely in speed and model. Of especial importance is a detailed statement of the measurements of motor boats, which gives accurate data concerning dimensions, the engines employed, and the speed attained. The photographs are very interesting from the fact that nearly all of the boats were going at much greater *relative* speeds than are attained by the fastest ocean steamships. The results of the trials may be considered as serving to some extent as model experiments indicative of possible development of extreme speeds in large vessels.—S. B. Sheldon is the general superintendent of the Lackawanna Steel Company of Buffalo, New York. Their plant is the largest individual unit in the world, and is the strongest competitor of the Steel Corporation, making rails, billets, merchant bars, structural iron, splice bars, plates, and, in fact, almost anything of standard varieties of rolled iron. The capacity of the plant is about 100,000 tons of finished material per month. The Lackawanna Company has six blast furnaces and eleven open-hearth furnaces, and has the distinction of being the only plant in the country that utilizes blast furnace gas for development of electrical power, also for furnishing air to blow the blast furnaces. The extent of the plant is about 500 acres. They also have a large battery of coke ovens. The number of employees is about 6,000.

—A recent letter from G. M. Basford states that he has changed his business connections, and has entered the service of the American Locomotive Company. His office is at 111 Broadway, New York.—In the program courses of Free Public Illustrated Lectures to be given at the public library of the city of Boston, we note that W. H. Kilham is to lecture on "Palladian Renaissance." This lecture is under the auspices of the Boston Architectural Club.—Hollis French, of the firm of Hollis French & Allen Hubbard, writes that among other work they are designing a sub-station for distributing electrical power to the town of Wellesley, and are also designing new street lining and commercial systems for the same town.

1890.

GEORGE L. GILMORE, *Sec.*, Lexington, Mass.

Professor H. M. Goodwin has succumbed to the inevitable at last. His engagement to Miss Mary B. Linder, of the Beaconsfield, Brookline, was recently announced.—William R. Peyton, with his family, of Duluth, was in Boston on a business trip early in October. Billy looked just the same as he did fifteen years ago, except that there is a trifle more of him than in those days.—Mr. and Mrs. John Crowther, Jr., of Lutherville, Md., recently announced the engagement of their daughter, Miss Mary Grace Crowther, to Cyrus Cates Babb, of Washington, D.C. Mr. Babb is a civil engineer in the United States Geological Survey. The wedding will take place early in the spring.—On October 19 Charles Hayden, of Hayden, Stone & Co., left for a month's trip to Mexico, to visit the Greene and Shannon properties, going by the way of St. Paul to attend the Twin City Railroad annual meeting. In November he went to Butte to inspect the properties of the East Butte Mining Company, and also visited many properties in which the firm is interested in Colorado, Arizona, New Mexico, and Canada. He has been appointed aide-de-camp on the staff of Governor Curtis Guild, Jr., with the rank of major. This is the same position held by Charlie two years ago on the staff of Governor Bates.—Rev. George F. Weld, of Hingham, was very ill at

his summer home for several months, but, when last heard from, he was reported as being in a very comfortable condition.—Guy C. Lowell left Boston in December to accept an important government position in the Department of the Interior.—H. P. Spaulding, the artist, with his family, is spending the winter in Italy. At last accounts he was located in Sorrento.—Following is from the Jamestown (N.Y.) *Evening Journal*:—

President F. L. Chase, of the Chautauqua Lake Road, has reason to feel happy, for the Lake Shore people have ordered 25 of the gasoline motors which he, with Bertrand M. Young, has perfected, and which will be used on the Chautauqua Lake Road next summer.

1891.

HOWARD C. FORBES, *Sec.*, 4 State Street, Boston.

In the recent railroad accident at Lincoln, Mass., one of the worst which has happened in Massachusetts, Herbert S. Kimball, who was on the train that was wrecked, had a most fortunate escape. A local train on the Fitchburg division of the Boston & Maine Railroad was closely followed by the Montreal express,—a heavy Pullman train drawn by two engines. At a point in Lincoln, known as Baker Bridge, the express train ploughed its way through the local train just as the latter was starting from the station. The two rear cars of the local were wrecked, the greatest loss of life being in the rear car. Kimball was in the next to the last car, but it was a mere turn of the hand as to which of these two cars he entered when he boarded the train. His account follows:—

I wanted to be in Fitchburg early Monday morning in connection with some reconstruction work which I am doing in one of the mills, so I decided to go up there on Sunday night. I took the electric car to Waltham, but, as the train for Fitchburg—the Montreal express—did not stop at Waltham, I was obliged to take the local train, intending to change to the express at South Acton. This is how I happened to be on the train which was wrecked. The local train was on time by the station clock at Waltham,

where a large number of passengers left the cars. By good fortune I did not enter the rear car, but took a seat in the next car about two-thirds of the way up. I sat down on the right-hand side of the car, under one of the oil lamps, and began to read. When I entered the train, I remember thinking that we were on time, and that the express was following us, also that the lights in the cars were of the oil variety; but I had no special apprehension.

The train stopped at almost every station, and I had been reading, I should say, about twenty-five minutes when the collision occurred. My impression is that the train had slowed down for a stop, but I would not be sure whether we came actually to a full stop or not. At any rate, the train was just starting up when there was a tremendous shock, and for an instant only I thought another car was being coupled on to the train, but the shock was much more violent. Immediately there was darkness, and one or two more shocks which threw me back and forth in my seat. The shocks were accompanied by a most dreadful noise, a rushing roar above all, and the grinding of the air brakes beneath. I expected every minute to be struck by something in the darkness, and to be thrown up into the air or out of the window, and I wondered when and how it would all end. Then for a second all seemed still, and I realized that the cars were on fire. In looking back in the semi-darkness, lighted by the fire which had started, I observed general confusion. Timbers of the rear car were pushed through my car and out through the roof, coming about half-way up the car and within about ten feet of me.

By the light of the burning car I could see that the glass in my window had been broken out, and I got out of the car by vaulting out through this window. Probably, in doing this, I received the cuts on my head and knee. My injuries were these cuts, a bump on the head, and a lame back, which were due to the jolting back and forth which I received.

When I got out, I went up on the bank. The wreckage was all on fire, and everything seemed in general confusion. The locomotives and cars were all in a heap, and the noise of the escaping steam from the locomotives was terrific. The people were climbing out of the doors and windows and the passengers from the rear train were running up, so that soon willing hands were at work removing people from the wreck. The awful sights that followed were the saddest I have ever seen. The relief train carrying the wounded to the hospitals, with its doctors and nurses in attendance, the railroad officials, kind and sympathetic, the reporters hovering around, imprinted upon my memory a scene never to be forgotten.

I was around the wreck from quarter past eight in the evening—the time that it occurred—until about eleven o'clock, and then went back to Waltham on the relief train. The doctor at Waltham fixed up my cuts, and sent me home in a carriage. I got home about one o'clock at night.

1892.

PROF. WILLIAM A. JOHNSTON, *Sec.*, Mass. Inst. of Technology,
Boston.

At the annual meeting of the New England Fire Insurance Exchange, held on Saturday, January 6, G. T. Forbush was elected president. He enjoys the distinction of being the youngest man who ever held that important position. He is considered an expert on sprinkler work, and also on chemical and electrical subjects in their relationship to fire insurance.—Stephen Bowen was married on November 9, 1905, to Miss Emily Francis Pratt.—Francis Walker has returned to Washington after spending several months abroad while engaged in special investigations for the Bureau of Corporations. His work took him into nearly every country on the Continent. He was in Russia during some of the recent disorders that have convulsed that country.

1893.

FREDERIC H. FAY, *Sec.*, 60 City Hall, Boston.

The following '93 men attended the annual dinner of the Alumni Association December 29: Barnes, Bemis, Blood, Braman, S. A. Breed, W. A. Clapp, Fay, Morss, C. W. Sawyer, Spofford, and Tucker.—Howard R. Barton, formerly in independent practice as a consulting engineer at 29 Broadway, New York, has taken into partnership Mr. Raymond Carpenter, under the firm name of Barton & Carpenter, and the new firm has moved to 149 Broadway, New York City. Mr. Carpenter is a specialist in factory equipment and machine design, and the new firm will carry on a general

practice as consulting mechanical and electrical engineers.—Grosvenor T. Blood has been elected a member of the school committee of the city of Newburyport.—Many '93 men attended the wedding of Miss Walley and Edward Dana Densmore on Oct. 24, 1905. The following account of the event appeared the next day in one of the Boston papers:—

Miss Annie Louise Walley, daughter of Mr. and Mrs. Edward Walley, and Mr. Edward Dana Densmore, were married last night at the Central Congregational Church, the Rev. John Hopkins Dennison officiating. The bride was gowned in a princess robe of white messaline, beruffed with lace. Her veil, a family heirloom, was of old Honiton lace, and she carried a shower bouquet of lilies of the valley, being escorted to the chancel by her father. She was attended by her sister, Miss Miriam Walley, who was gowned in rose-pink chiffon crepe, and carried a bouquet of Wellesley roses, the shade of her gown. Mr. Ellis Densmore was best man, and the ushers were Messrs. John Densmore, Albert Densmore, J. P. Sylvester, Gifford LeClear, Thomas H. Russell, 2d, Philip C. Stanwood, and Samuel H. Walley. The bride is a graduate of Radcliffe, '04, and the groom graduated from Tech in '93, and was a post-graduate of Harvard the following year. He is a member of the firm of Densmore and LeClear, mechanical engineers. A reception followed at the home of the bride's aunt, Mrs. Arthur G. Stanwood, 189 Bay State Road, where the young people were assisted in receiving by the parents of each. The groom is a son of Mr. Charles Dana Densmore, of Somerville. Mr. and Mrs. Densmore on their return from their wedding journey will reside in Cambridge.

—James A. Emery, general manager of the Birmingham (Ala.) Railway, Light, and Power Company, was North in November, and visited friends in Boston and Haverhill.—Under the title "A Musical Poet of Childhood" the *Outlook* of the 23d of December published an article by Arthur Farwell upon the German composer Engelbert Humperdinck, whose opera "Hänsel and Gretel" and other compositions have won for him world-wide fame. While studying music in Germany and France from 1897 to 1899, Farwell was a pupil of Humperdinck, as well as of Pfitzner and Guilmant.—

Oren E. Parks has recently been elected a member of the American Society of Civil Engineers. For nearly twelve years he has been town engineer and engineer of water works of Westfield, Mass.—Walter W. Patch is connected with the United States Irrigation Service at Belle Fourche, So. Dak., as engineer in charge of the second division of the Belle Fourche irrigation project. He has designed and is about to construct a storage reservoir of eight thousand acres and seventy billion gallons, storage capacity, including the building of a large earthen dam, 6,500 feet long, 115 feet maximum height, and containing 1,600,000 cubic yards of material. The dam is to be built of clay mixed with very fine sand, and is to have no core wall. Its up-stream face will be paved with large blocks of concrete to resist the action of waves and ice. The Belle Fourche project will provide for the irrigation of about ninety thousand acres of land by means of a hundred miles of main canals and more than a thousand miles of lateral canals. Work will soon be begun upon some of these canals under Patch's direction, and one of his problems is the building of an inverted syphon, probably of reinforced concrete, to carry water under considerable head across a stream. The Belle Fourche district is situated upon rolling prairie at an elevation of about three thousand feet above the sea and some thirty miles distant from the Black Hills. At the site of the reservoir Patch has built a small settlement, supplied with running water from a fourteen-hundred-foot artesian well, equipped with a sewerage system, connected with the town of Belle Fourche, twelve miles distant, by telephone, etc., so that life upon the prairie is not without its comforts, while offering at the same time great advantages for hunting. During the past fall Patch's party served over two hundred and fifty wild duck upon their mess table, not to mention quantities of other game. Patch expects to remain at Belle Fourche four years, and in the spring will remove his family thither.—Walter I. Swanton, formerly in the Supervising Architect's Office in Washington, now has charge of engineering accounting in the Reclamation Service.

1894.

PROF. S. C. PRESCOTT, *Sec.*, Mass. Inst. of Technology, Boston.

C. G. Abbot has been spending the summer in California at an observatory on Mt. Wilson established by the Smithsonian Institution, where he has been carrying on some observations on the variation of the heat of the sun. This observatory is at an elevation of about six thousand feet, and approximately one thousand feet above the cloud line, so that excellent weather conditions for observations are of almost daily occurrence. Abbot reports that no rain has fallen since May. The sun shows variations in heat of from five to ten per cent., and these cause changes all over the world. It is interesting to note that the weather during the summer and fall has corresponded very closely to predictions made by Abbot as a result of his study of the sun. He has also designed a new instrument for measuring the heat from the sun's rays falling per minute over a measured area, and this seems likely to prove the most accurate and efficient pyrheliometer yet devised.—On the 17th of October at the Pawtucket Congregational Church occurred the wedding of Kenneth W. Wood and Miss Elizabeth Lee Goff, daughter of Colonel Lyman B. Goff. According to the Boston papers a feature of the wedding was the attendance of many of the mill hands of the Sayles Bleacheries where Wood is mechanical engineer, and the Pawtucket Girls' Club, an organization composed mostly of working-girls in whose welfare Miss Goff has been especially interested.—H. A. Swanton is now engaged in the manufacture and sale of a new high-speed engine of small size which he has designed. It is especially applicable for dynamos, fans, pumps, and for electrical generating sets. The special feature of this engine is that the working parts are inside an oil and dust proof casing.—One of the most important architectural competitions ever held in Pittsburg has been decided by Architects MacClure and Spahr being accepted as the designers of the 20-story sky-scraper which the Union National Bank will erect. This building will be 20 stories high, according to the competitive plans, and will cover a site 86 by 84 feet. One of the papers says:—

The firm of MacClure & Spahr, which carried off this architectural plum, is one of the youngest firms of architects in the city, but has already gained an enviable reputation for work done in this and other cities. They designed the Diamond Bank sky-scraper, and the Keystone Office Building. They have also built a large number of the finest residences in the East End, and have been selected to design the \$100,000 club-house of the University Club.

—Gardner and Brown were recently awarded a first prize of several hundred dollars for a design for certain interior furnishings for houses.—A. G. Robb was married on August 9 to Miss Lavinia Grace Steele, daughter of Dr. and Mrs. Steele, of Amherst, N.S. They make their home in Amherst, where Robb is superintendent of the Robb Engine Company.—A. A. Claffin is now president of the Avery Chemical Company. Their factory is at Littleton, Mass., and the Boston office at 7 Sears Street.—H. R. Barton has become a member of the consulting firm of Barton & Carpenter, 149 Broadway, New York.—P. H. Coolidge is manager of the Western Electric Company, Philadelphia, Pa. His office is 11th and York Streets.—H. P. Dates has resigned his position of professor of electrical engineering at Boulder, Col., and has accepted the professorship of electrical engineering at the Case School of Applied Science at Cleveland.—T. C. Davies stopped a few days in Boston on his way from his old home in England to his present home in the Sandwich Islands.—A. A. Shurtleff has opened an office as a landscape architect at 22 Congress Street.—J. E. Thropp is back at Everett, Pa., in charge of the furnaces, mines, etc., of the Everett Furnace Company.—A. W. Tidd is now located at Pawling, where he is assistant engineer for the New York Aqueduct Commission.—V. A. Mayer is general manager to the Climax Manufacturing Company, 1 Hartford Street, Boston.—L. R. Moore is assistant inspector of gas and gas meters for Massachusetts.—W. A. Patch is now an engineer in the United States Reclamation Service, with headquarters at Belle Fourche, So. Dak.—L. W. Pulsifer, one of the most brilliant of the architects in the class, died in Denver, Col., on the 9th of July.—A. H. Sawyer is president of the Boston & Florida Atlantic Coast Land Company.—W. S. Hulse, after eleven years away from the

country, is now secretary and treasurer of the Empire Engineering Corporation, 111 Broadway, New York.—W. H. King is assistant corporation counsel to the city of New York.—H. K. McGoodwin is instructor in architecture at Washington University, St. Louis, being associated there with F. M. Mann, also of '94, who is professor of architecture.—F. M. Leonard has opened an office as civil engineer at 185 Charles Street, Boston.—H. R. Bates has accepted a position in Omaha.—C. A. Howes has just announced his engagement to Miss Florence Baird, of Somerville.—Mason S. Chace, of New York, formerly president of the Crescent Shipbuilding Company of Elizabeth, N. J., who was technical adviser at the Kawasaki shipyards in Kobe, Japan, during the war with Russia, is now on his way home.

1895.

WILLIAM T. HALL, *Sec.*, Mass. Inst. of Technology, Boston.

Following is from the *Engineering News*, Nov. 30, 1905:—

Judson C. Dickerman, a graduate of the Massachusetts Institute of Technology, and recently superintendent of the Merrimac Chemical Company of Boston, Mass., has been appointed assistant professor of chemical engineering in the college of engineering of the University of Wisconsin. Professor Dickerman brings to his new work considerable experience in the manufacture of a large variety of chemicals, in the construction of plants, installation and operation of machinery, and the development of new processes and methods in connection with chemical work

—Madison M. Cannon was elected a member of the Quincy City Council for 1906. He is a civil engineer with the Fore River Shipbuilding Company.

1896.

EDWARD S. MANSFIELD, *Sec.*, 70 State Street, Boston.

This is the year for our decennial celebration, and the committee appointed at the last annual meeting of the class has in charge the arrangements for a characteristic "old time spirit" celebration to

last from one to three days, and all '96 men are urged to plan their vacations in such a way that they may be present during some part of the period, the exact date of which and the place of meeting will be announced later. The publishing of a class directory is also in the hands of this committee, and it is expected that active work in this direction will commence very soon, and it will be a great help to the committee if slips asking for statistical data are filled out when received, and returned as soon as possible by all graduates and former members of the class.—E. C. Hultman has again entered the political field, and at the last election was chosen as one of the representatives to the General Court from Quincy.—M. L. Fuller (XII.), has just completed for the United States Geological Survey an investigation of the artesian waters of South-eastern North Carolina. He was assisted, among others, by B. L. Johnson, '05.—Quite a colony of Tech men is reported at Wilmington.—The following is clipped from the Houston (Tex.) *Chronicle*, the edition of October, 1905:—

Mr. J. M. Howe is one of the best-known civil engineers of the State of Texas. He is an associate member of the American Society of Civil Engineers, and ranks among the foremost of his profession in the United States.

Mr. Howe has a well-equipped office in room 232 Commercial National Bank Building, and is prepared to handle all civil engineering business that may be desired.

Mr. Howe is known as an engineer of the highest ability, and he is equipped with the most up-to-date instruments for handling his business. There is no man in the State who can follow this profession with more accuracy than he, and his name appended to any civil engineering work is proof of its correctness.

During the many years he has resided in this city Mr. Howe has won an enviable place in the esteem of the public, and especially of those who have had work done by him.

—J. Lloyd Wayne, of Indianapolis, Ind., in charge of the equipment department of the Central Union Telephone Company, spent a part of his vacation in and about Boston, calling upon a number of the class in this section.—Joseph H. Knight was married to Miss

Edith Blinn Holwell, of Pittsfield, Mass., on Wednesday, Jan. 3, 1906.—Charles Morris, Jr., who was paymaster on the "Bennington" at the time of its disaster, has been appointed to shore duty, and is now stationed temporarily in Boston, awaiting an appointment to some specific location. Mr. Morris finds the Boston weather rather severe after a sojourn in the southern seas.—A tourist passing through Los Angeles, Cal., reports meeting R. S. Hardy, who is engaged in the real estate business in that place.—The secretary has taken up his residence at 5 Cottage Avenue, Winchester, Mass.

1898.

PROF. C.-E. A. WINSLOW, *Sec.*, Mass. Inst. of Technology, Boston.

The class of '98 held its first informal reunion for the season on November 17. It took the form of a planked steak dinner at the Burger Bräuhaus on Hayward Place, and proved a great success. The following were present: Danforth, Coburn, Roberts, Ayres, Perley, Coombs, Russ, Sherman, Wright, Riley, Dodd, Goodrich, Butterworth, Butcher, Winslow, Paige, Curtis, and Shedd, particularly Shedd. Song and steins helped to pass a very pleasant evening, with some informal discussion of the dulness of other classes in not holding similar reunions.—O. L. Leonard was married September 23 at Denver, Col., to Miss Janet L. Macewen. Mr. and Mrs. Leonard are at home at 1136 South 15th Street, Denver.—T. E. Tallmadge and Vernon S. Watson, licensed architects, announce that they have formed a partnership for the practice of architecture, and have opened offices at 309 Ashland Block, Chicago.—W. M. Perley represents the Palmetto Metal Company, manufacturers of high-grade anti-friction bearing metal, of 589 W. Lake Street, Chicago.—Everett N. Curtis has recently moved his office from 82 to 161 Devonshire Street.—J. G. White & Co. have recently issued the following biographical sketch of a '98 man:—

Mr. Strickland was born in 1875, and graduated in civil engineering from the Massachusetts Institute of Technology in 1898. During the Spanish-American War he served at Mare Island Navy Yard, and later on board the

United States steamship "Bennington" as assistant engineer. While on this vessel, he had charge of the operation, maintenance, and repair of all the machinery about the ship. Since the war Mr. Strickland has been in the service of the Blake Pump Company and the Buckeye Engine Company as draughtsman, and with the Case Manufacturing Company, both as assistant and chief engineer, designing special electric cranes and controllers. In 1900 Mr. Strickland made the hydraulic calculations for the North Fork Power House scheme at Denver, Col. Upon the completion of this work he joined the staff of the Colorado Fuel and Iron Company as engineer of location on a standard gauge line over M'Clure Pass. He also located several electric and steam narrow gauge lines in Colorado. In 1902, as designing engineer for the Lannius Machine Company, Mr. Strickland laid out its combined amalgamator, concentrator, and arastra. He was appointed location engineer on the New York Central R.R. in 1903, and supervised the extension from Cherry Tree to Possum Glory, as well as several of their double tracking and grade revision schemes. For the past year Mr. Strickland has been assistant engineer in the Maintenance of Way Department, handling correspondence from all divisions relating to the repair and construction of bridges and buildings.

Mr. Strickland is associated with J. G. White & Co. as assistant to the secretary, with headquarters at the main offices of the company, 43 Exchange Place, New York.

—Steffens writes to the secretary as follows:—

Another '98 man left the New York Central. I left there late in November to accept position of engineer of bridges and buildings with this company that is building a first-class railroad from near the Ohio River at Elkhorn City in Kentucky, through the States of Virginia, Tennessee, North Carolina, and South Carolina, to a terminus for the present at Spartanburg, S.C. The line may, however, be pushed rapidly through to the seacoast at Charleston, as additional surveying parties are now working forward. The road is financed by some of the strongest capitalists of the country, and while it primarily will carry an immense tonnage of coal from the hitherto unexploited rich deposits in Wise and Dickenson Counties, Virginia, to the heart of the cotton industries of South Carolina, it will, from its geographical location, develop a fine through passenger business between the great seaport of Charleston and the lines leading to the lake cities and the West in general. The construction of such a line, passing,

as it does, over and through the southerly end of the Alleghany Mountains, involves exceptionally heavy work, long tunnels, high viaducts and fills, but full of interest from an engineering standpoint.

I am delightfully situated in the town of Bristol, which lies on the border line between Virginia and Tennessee. It is quite a commercial centre, as it is a distributing point for this section of the country. The climate is not unlike that of Asheville, N.C., which is not far south. From all indications I should estimate that this section of the country is the one that should possess wonderful opportunities for development during the next quarter of a century, and I feel fortunate to have entered it at this time.

1899.

DR. M. S. SHERRILL, *Sec.*, Mass. Inst. of Technology, Boston.

On Monday evening, December 18, a very pleasant reunion of men of '99 in the vicinity of Boston was held at Mieusset's Restaurant. There were present W. O. Adams, H. C. Eaton, D. M. Pray, B. R. Rickards, C. L. Morgan, T. C. O'Hearn, R. C. Harrison, C. M. Swan, M. S. Sherrill, Haven Sawyer, Etheredge Walker, Thomas Todd, and P. W. Witherell. After dinner the entire party went to see George Ade's comedy, "Just out of College," at the Park Theatre.—Walter Adams has returned to Boston after an absence of a little more than a year with the Oldsmobile Company of Detroit. The class will always be indebted to Adams for putting the graduate class organization on a firm basis, and the Boston members welcome him back among them. He is now business manager of the Boston office of the Oldsmobile Company.—Harrison, Sawyer, and Walker are unfortunately only visitors with us. For the last few years Sawyer and Walker, who have been together more or less since graduation, have been located in Gazelle, Siskiyou County, California, as mining engineers. At present they are carrying on an investigation of certain gold ores in the Mining Department of the Institute, but expect soon to return to the West. Harrison will remain East till spring, when he, too, will leave for the West. Their experiences and stories of western life are extremely interesting.—Burt Rickards is to be congratulated on his appointment as director of the bac-

teriological laboratory of the city board of health. Below is the account taken from the *Boston Herald* of November 4:—

Burt R. Rickards was appointed director yesterday of the bacteriological laboratory of the city board of health. He has been an assistant for five years, so that the appointment is a promotion. He succeeds Dr. Hill, who has gone to Minneapolis.

Mr. Rickards was born in Cambridge in 1876, was educated in the Cambridge schools and the Institute of Technology, where he was graduated in 1899. He made a specialty of chemistry there, and took a large amount of biology in his course. After graduation he taught chemistry for a year in the Lowell Textile School, and in August, 1900, came to the board of health laboratory. There his work has been largely in the diagnosis of infectious diseases and the devising of simpler but surer methods of examining suspected sputum and other dejecta of disease. Mr. Rickards is married, lives in Brighton, and is a member of the American Public Health Association, the Society of American Bacteriologists, the American Chemical Society, and the Massachusetts Association of Boards of Health.

—Frank F. Fowle and Miss Edna Cowper were married on Tuesday, Oct. 17, 1905, at the home of the bride's parents in Buffalo, N.Y. After a wedding sojourn of one month in the Catskill Mountains Mr. and Mrs. Fowle removed to New York City, where they have been at home to their friends since December 1. Mrs. Fowle is a sister of Howard M. Cowper, M. I. T. '05. Fowle is with the American Telephone and Telegraph Company, 15 Dey Street, New York, as special agent of the railway department.—James B. Ellery was in Boston for a few days shortly before Christmas. He seems to like his work as assistant superintendent of the Open Hearth Department of Carnegie Steel Company, Duquesne, Pa. He reports that Benj. P. Hazeltine is doing well with the National Tube Company in McKeesport, Pa.—A letter from W. C. Phalen, of the United States Geological Survey in Washington, dated November 24, states:—

I reached town on the 5th of the month, after a field season of a little more than six months' duration. Five of these months were spent in Kentucky. I surveyed, geologically, nearly the whole of a 30-minute quadrangle; *i.e.*,

one-quarter of a square degree in the north-east corner of the Blue Grass State. My field season was a most charming and delightful experience.

—George E. Lynch was married last June to Miss Helen A. Spaulding, of Silver Creek, N.Y. Lynch is with the Jeffries Manufacturing Company, Columbus, Ohio.—Dwight Farnum is on East for a vacation, but will return to Hailey, Ida., as superintendent of the Wood River Zinc Company.

1900.

RICHARD WASTCOAT, *Sec.*, Dedham, Mass.

The secretary has heard of only two members who have lately forsaken the "paths of single blessedness." All Course I. and XI. men will be surprised and pleased to hear that the "doctor" has at last joined the ranks of the married men. "We" (it was addressed Mr. and Mrs., evidently he has the secretary confused with some other poor fellow) received the announcement: "Rev. Samuel Henderson Moore announces the marriage of his daughter Abigail to Mr. Frederick Whitefield Witherell on Tuesday, October seventeenth, nineteen hundred and five, New Castle, Pennsylvania." We extend our congratulations to Witherell. At last accounts he was sanitary engineer with the American Water Works and Guarantee Company of Pittsburg, and tested the different plants controlled by this company regarding the purity of the water supply.—James H. Batcheller (III.) was married Oct. 18, 1905, to Miss Elizabeth T. Field, of Boston, at Mattapoisett, Mass. Our congratulations to Batcheller. The past fall was the first time for over three years that he has been East, and it surely was with a worthy purpose in view that he came this fall. Batcheller has probably seen as much of the Western mining country as any of our Course III. men. In November and December, 1903, he made a mining trip to Mexico City, Achorcado, State of Queretaro, and Santa Barbara, State of Chihuahua, in Old Mexico, and the rest of the winter he spent in Idaho. In June, 1904, he went to the Treadwell Mine in Alaska for a couple of months, and then for six weeks he was further north at the Kensington Mine, Comet City, in Alaska. In

October, 1904, he went to the Bourne Gold Mining Company in Bourne, Ore., for eight months, and to the Oregon Smelting and Refining Company at Sumpter in the same State for a month. He is now *en route* for the Mariposa Commercial and Mining Company at Mt. Bullion, Mariposa County, Cal., where he expects to pass the winter.—R. H. Clary (III.), who has been located at Seattle, Wash., has left there, and is now at Benson, Ariz., where he is ore-purchasing agent for the South-western Smelting and Refining Company of that place.—The following item appeared in the *Railway and Engineering Review* under the Engineering and Maintenance of Way column:—

Mr. P. H. Delano has been appointed division engineer of the Cleveland, Cincinnati, Chicago & St. Louis, in charge of construction on the Cincinnati Division, with headquarters at Middletown, Ohio.

Delano was a member of Course I., and we extend him congratulations on his promotion. He was formerly division engineer on the Buffalo & Susquehanna Railway Company, with headquarters at Belfast, N.Y.—Robert M. Hopkins (VI.), who has been with Charles A. Chapman, consulting engineer, in Chicago, is now located with the Alberger Condenser Company, 800 Liberty Street, New York. Chapman adds one more to the numerous 1900 men in New York City, including at last accounts Barney (XIII.), Blair (VI.), Brooks (II.), Brown, C. H. (X.), Clow (IV.), Ellis (V.), Hall, S. M. (VI.), Jouett (I.), Keith (VI.), McGowan (II.), Merrick (IV.), Pigeon (IV.), Rand (IV.), Price (IV.), Searle (I.), Tudbury (I.), Ziegler (II.). 1900 men ought to have a strong association with so many settled in one city.—Morgan Barney has been in business for himself at 29 Wall Street, New York, for the past three years as a naval architect and yacht broker, and handles everything from a ninety-footer to a row-boat or an ocean liner. Barney lives at the Technology Club at 36 East 28th Street. More 1900 men should make this place their home.—William B. Hough (VI.) is connected with a Chicago concern interested in cement and reinforced concrete construction.—Harry E. Osgood (II.), who was with the Holmes & Blanchard Company, Boston, started in

business for himself last February, forming the Osgood Machine Company, which has been very successful. They handle and install all kinds of grain handling machinery and appliances, and are located in Boston.—Harry E. Thayer (V.) is located in Cincinnati, Ohio, and has a fine position as superintendent for the Proctor & Gamble Company. He is married, and has two children.—Walter L. Rapp (IV.) is in business with his father in Cincinnati. They are the best-known firm of architects in that city, and Rapp has lately designed one of the finest bank buildings in the city, which is now in the course of construction. He is also married.—Russell Suter (I.) is out in the Philippines, in the island and town of Cebú. He designated the town as “rotten,” the island as a “pile of rocks,” and the “Islas Filipinos” as a “d—d hole.” Evidently, he is not in love with the country. Suter calls himself an assistant engineer on the Cebú Harbor Improvements, but the secretary has heard a rumor that he has been a medical inspector, sanitary officer, and various other things, including “chief scratcher of arms” when the small-pox was prominent in that region.—Carl F. Gauss (IX.) is at present in charge of the office of the Goldfield Electric Light and Power Company, a sub-company of the Nevada Power Company, and is located at Goldfield, Nev.—Henry C. Morris (III.) is also in Goldfield as superintendent of the Blue Bell Mining Company.—Irving C. Weeks (IX.) is a teacher of physics and chemistry in Williston Seminary, Easthampton, Mass., where he has been for three years. For a year previous to this he was engaged in reform work in the reformatory institution at Windsor, Conn.—Howard R. Dunbar (II.) recently announced his engagement to Miss Helen R. Sumner, of Canton, Mass. Dunbar is at present a draughtsman in the Lamson Consolidated Store Service Company of Boston.—Edward H. Davis (IX.) is instructor of history and economics in Purdue University, West Lafayette, Ind.—Herbert H. Howe (IX.) is with the bonding house of John P. O'Brien & Co., Boston.—Joseph F. Draper (IX.), after leaving Tech, studied at the Harvard Law School, and received the degree of B.L. He is now practising law at 15 State Street, Boston.—George E. Russell (I.) is back at the Institute as instructor in civil engineering, and is assistant to Professor Porter. Russell

made a study of hydraulic work while he was instructor at Cornell last year, and has taken up that line of work at the Institute.—Carleton Ellis is now located at 60 Wall Street, New York, as general manager of the Combustion Utilities Company. Ellis is married, and has two children, and resides at White Plains, N.Y. He went to New York as chief engineer of the Eldred Process Company, and the present company in which he is interested is putting in gas producers of Ellis's invention for industrial concerns using gas engines as power. He is also a registered patent attorney.—R. W. Balcom has returned to this country, and his present address is Ann Arbor, Mich. He obtained the Doctor's degree at Heidelberg last summer, and is at present an instructor in general chemistry at the University of Michigan.—Jere. R. Danniell was married on Saturday evening, January 27, to Miss Anna Harding Lippincott, at Christ Church, Woodbury, N.J.

1901.

E. B. BELCHER, *Sec.*, Malden, Mass.

The first informal meeting and dinner of the class was held at the Union on Friday, January 12. During the evening several selections were rendered by a blind vocalist. It is hoped that the members of the class will do what they can to support these meetings, and notify the secretary of any changes in address.—Ralph Whitman (I.) has secured a permanent position with the Panama Canal Commission at Washington. Whitman has just returned from a six months' stay at the Isthmus.—R. E. Simonds (II.), until recently connected with the McKay Shoe Machinery Company of Winchester, has entered the employ of Dean & Main, of Boston, mill architects and engineers.—Harry White (XIII.) is with the National Lead and Paint Company, Philadelphia.—John Ross, Jr., has returned to the Institute as assistant in battleship engineering.—William Whipple (II.) is superintendent of the Cinclair Central Sugar Refinery, one of the finest refineries in Louisiana.—H. R. Gilson (II.) is with the Submarine Telegraph Company of Boston, as mechanical engineer.—W. O. Kennard is recovering from a

very severe case of typhoid fever.—A. H. Williams has resigned from the Supervising Architect's Office, Treasury Department, to accept a position with Adams & Schwab in Baltimore.—At a meeting of the Board of Directors of the Newton Street Railway Company, Newton & Boston Railway Company, and Lexington & Boston Railway Company, M. Matthew C. Brush, was elected vice-president.—At the examination held October 17 for assistant engineer, highest grade, Board of Water Supply of New York City, of the nineteen who passed, L. P. Wood was number one on the list. The following six Institute men were also successful: S. D. Dodge, '93, S. K. Clapp, '95, J. L. Hildreth, Jr., '96, J. A. Gutbridge, '97, W. D. Hubbard, '98, and G. T. Seabury, '02. These men are eligible for appointment, at \$2,000 per year, to positions in responsible charge of surveys and design, and later of construction.

1902.

C. W. KELLOGG, JR., *Sec.*, El Paso, Tex.

The reports of weddings still continue to come in. Every one in the class will be delighted to learn that Red Proctor was married to Miss Mary Sherwood Hedrick this fall. It will be remembered that Proctor's cards were out for his wedding nearly two years ago (namely, January, 1904), and that he had to flee to Saranac Lake for his health at the last minute.—Place was married to Miss Mabelle Hamilton Boyd at Hyde Park, Mass., on Sept. 18, 1905. They are now at home at 524 West 162d Street, New York City.—Montgomery was married on the 20th of November, 1905, to Miss Louise Titus Severance at Cambridge, Mass.—Rogers has been made manager of the Ponce Railway and Light Company of Ponce, Porto Rico.—Kellogg has been changed by Stone & Webster from the Edison Electric Illuminating Company of Brockton, Mass., to the El Paso Electric Railway Company of El Paso, Tex.—Mendenhall is now with the Utah Light and Railway Company, Salt Lake City, Utah.—Mayo is sanitary and heating engineer in the quartermaster's office at large, War Department, Washington, D.C.—B. G. Philbrick

is with the Lederle Laboratory, New York City, address 42 Strong Place, Brooklyn, N.Y.—Capen is with the Nebraska Telephone Company, Omaha, Neb.—C. B. Allen severed his connection with the Westinghouse Machine Company of Pittsburg early in December to take the position of assistant superintendent of marine construction with the New York, New Haven & Hartford R.R. Co., with headquarters in New York City.

1903.

WALTER H. ADAMS, *Sec.*, Polytechnic Inst. of Brooklyn,
Brooklyn, N.Y.

On November 4 Goodwin (III.) was married to Miss Rebecca Clematena Headden.—Lounsbury (VII.) appeared in the secretary's office at the Polytechnic Institute one day in November, and said that he was working downstairs in the water analysis laboratory as a chemist for Hazen & Whipple, a firm of New York chemists, having just accepted the position. Since graduation he has been an assistant in the chemical laboratory at the Worcester Polytechnic Institute and chemist in the bureau of chemistry at Washington, D.C.—One day last summer the secretary had a letter from Bay, giving a short history of his adventures since graduation in 1903. After graduation he was a draughtsman with the Newport News Shipbuilding and Dry Dock Company at Newport News, Va. During October, November, and December of 1904 he took a trip around the "Horn" from Norfolk, Va., to Seattle, Wash., on the steamship "Minnesota." Since June, 1905, he has been with the Illinois Steel Company in Chicago, Ill., as a steam expert.—In November the Executive Committee, after strenuous (?) effort, sent off the second annual report, which every one ought to have by this time. On February 15 the first register to be published since graduation will go to the printer, and probably will be mailed by March 1.—The following list will give the location of those whose names did not appear in the July REVIEW: Jackson is with Sturgis & Barton, architects, Boston.—J. R. Jones is in Sanborn, Mexico.—Joyce is a

chemist with Arlington Pyraline Company, Arlington, N.J.—Kearney is electrical engineer with Westinghouse Electrical and Manufacturing Company, Wilkinsburg, Pa.—Lang is an architect with Cram, Goodhue & Ferguson, New York.—Lawton is draughtsman in the construction department of New York, New Haven & Hartford R.R., and is located at New Rochelle, N.Y.—Lockridge is engineer for the water department at Springfield, Mass.—Loughlin is doing geological work and studying at Yale.—Lyon is draughtsman in Pawtucket, R.I.—MacDonald is superintendent of the Dominion Cartridge Company's factory at Brownsburg, Quebec.—MacGregor is in the spool business at South Lincoln, Me.—Mason is assistant chemist with American Woollen Company, Washington Mills, Lawrence, Mass.—W. R. McCornack is with Experimental Committee of Museum of Fine Arts, Boston. McIntosh is superintendent of the boiler department for J. J. Case Threshing Machine Company, Racine, Wis.—Mears is assistant superintendent with Consolidated Car Heating Company, Albany, N.Y.—Merrill is chemist with National Calfskin Company at Peabody, Mass.—Millard is engineer on construction work at New Haven, Conn.—Mohler is in Colorado Springs, Col.—Morse is with the Geological Survey in Montana.—Mulherin is assistant engineer with John W. Allison & Co. in Philadelphia, Pa.—Newman is assistant engineer with Kern River Company, Borel, Cal.—Ni-becker is sanitary engineer at the Birmingham water works, Birmingham, Ala.—Nields is with mining engineering company in Cleveland, Ohio.—Nutter is manager for N. H. Nutter, wholesale dealer in wood in Lynn, Mass.—Olmstead is chemist with Little & Walker, chemical experts in Boston.—Palmer is designer with H. H. Franklin Manufacturing Company, Syracuse, N.Y.—Parker is with the Bucyrus Company in South Milwaukee, Wis.—Pearsons is wire chief with New York and New Jersey Telephone Company, and is located at Bath Beach, N.Y.—Place is assistant engineer with the United States Geological Society, doing reclamation work, and is located at Denver, Col.—Pulsifer is chemist for Pittsburg & Sonora Gold Company at Bacoachi, Sonora, Mexico.—Raymond is mechanical engineer with Missquoi Pulp Company at Sheldon Springs, Vt.

—Regan is draughtsman in the Sewer Division of the Street Department of the city of Boston.—A. P. Rice is inspector of dredging for Massachusetts Harbor and Land Commission in Boston.—Robertson is a paper manufacturer in Hinsdale, N.H.—Robinson is general manager and treasurer for the Gridley Mining Company at Joplin, Mo.—Ruxton is still at the Institute.—Sears is electrical inspector with the Minneapolis Fire Underwriters' Inspection Office at Minneapolis, Minn.—Miss Stevenson is teacher of science in the Howe School at Billerica, Mass.—Stiles is head of the firm of H. A. Stiles & Co. in Boston, who are the sole Eastern agents for Hamilton Emery and Corundum Company.—Strong is a travelling salesman for Farbenfabriken of Elberfeld Company of New York.—Sumner is with F. W. Bird & Son, paper manufacturers, East Walpole, Mass.—Swett is still at the Institute.—Taylor is an assistant in the department of small motors at the West Lynn works of the General Electric Company.—Thwing is a machinist at Newton Upper Falls, Mass.—Tolman is studying at the Institute.—Tuell is assistant to the superintendent of the Terre Haute (Ind.) Traction and Light Company.—Underwood is assistant superintendent of blast furnace for the National Tube Company at Wheeling, W. Va.—Wehner is chief draughtsman with the Bucyrus Company at South Milwaukee, Wis.—Whitehead is manufacturing chemicals at Medford, Mass.—R. B. Williams is metallurgist with the South American Development Company at Guayaquil, Ecuador.—Winchester is with Stone & Webster in Boston.

1904.

CURRIER LANG, *Sec.*, Crafton, Pa.

The class letter this time might better be labelled the scrap heap than anything else. There is no news of the whole body, but the members have been active, and the quiet observer who listens for sounds from the class hears only a steady hum that means "All busy." The following individual notes are all that have sounded above the hum: Bernard Blum is with the Chicago Junction Railway Company on sewer work and the construction of a large freight

house.—E. W. Charles is in the gas engine department of the Snow Steam Pump Works.—Captain Curtis has lately accepted a position with the New York, New Haven & Hartford R.R. as transitman in the real estate department, and will have his headquarters at New Haven.—Charlie Rodgers has gone to work for the Lamson Company, which is a part of the American Pneumatic Service Company, as assistant to the superintendent in the Lowell factory.—Evans is a draughtsman in the special construction department of the same company.—Earl Ovington was unfortunate enough to be burned out of his factory a short time ago.—C. E. Broad is a draughtsman (reported to be the only one) with the Stanley Motor Vehicle Company at Newton, Mass.—R. E. Havens is with the Santa Fé Railroad at Trinidad, Col.—W. A. Hyde is acting as electrical expert for the Bureau of Ordnance of the Navy Department, Washington, D.C.—C. H. Brigham is clerk and treasurer for the Architectural Testing and Inspecting Bureau of Boston.—G. W. Francis, a former member of the class, is now in Delaware State College, but hopes to be able to return to Tech later and take a degree.—“Bob” Phinney is with the Swan Electric Company.—H. B. Cooper is with Stone & Webster.—F. K. Merriman is with the Moren Engineering and Construction Company of St. Louis, and is located at Apalachicola, Fla.—At least three weddings of members of our class have taken place since the last class letter was written. On Tuesday November 21, H. E. Thompson was married to Miss Mabel Anne Tracy at South Coventry, Conn.—E. O. Hiller was married to Miss Brown, of Newton Centre, Mass, two of the ushers at the wedding being Homer and Holcombe of the class.—J. F. Card was married on September 20 to Miss Blanche Felt, of Chicago. The wedding took place in the pretty Kenwood Parish Church in Hyde Park, and was more or less a Tech affair. Among the ushers were C. J. Emerson and C. Lang.—Others of our class have undoubtedly left their former state of single blessedness, but they are not publishing the fact.

1905.

R. H. W. LORD, *Sec.*, 248 Tremont Street, Newton, Mass.

W. G. Bent and J. H. Payne, who are with the Eastman Kodak Company at the Kodak Park works, write that they like the work very much. There are eight Tech men in the factory.—Chesterman (Course VI.) has been in Rochester for a month, investigating long-distance transmission for the American Telegraph & Telephone Company.—R. H. White (Course VIII.) is with Charles H. Jacobs, Laboratory, New York City.—We hear that the firm of Dean, Lambie & Jones has been formed in Buffalo. All members of the firm are 1905 men, and, being the first to start out for themselves, we all wish them success.—William G. Houskeeper's address has changed to 703 Pitt Street, Wilkinsburg, Pa.—R. L. Segar has been compelled to leave the Institute on account of a complete nervous breakdown.—The 1905 class dinner will be held at Marliave's, 11 Bosworth Street. Having had to undergo a surgical operation, the secretary has been unable to make definite arrangements; but notices to all members of the class will be sent out later.—Bent, Marcy, Eichler, P. M. Smith, and R. Davis were seen around the Institute at Christmas time.—We are pleased to hear that Bushnell has been elected secretary of the Technology Club.—A. J. Amberg, of Chicago, was in Boston about December 1 on business.—Thomas G. Pinkerton was married January 1 to Miss Gertrude Ann Caskin of Danvers. After February 1 they will be at home, 820 Beacon Street, Boston.

Since the last issue of the REVIEW the address and occupation of the following men has been determined:—

William W. Ammen (XIII.), 1112 N. Eutaw Street, Baltimore, Md.

Assistant Examiner, United States Patent Office, Washington, D.C.

Courtlandt W. Babcock (VI.), care Westinghouse Electric Company, Pittsburgh, Pa. Apprentice with Westinghouse Electric Company.

James P. Barnes (VI.), The Snowdon, Syracuse, N.Y.

Designer with Pass & Seymour.

Robert S. Beard (I.), 38 S. Beaver Street, York, Pa.

City Draughtsman.

- Raymond E. Bell (II.), 146 Madison Avenue, New York.
Assistant Engineer with James B. Snook's Sons.
- Lloyd T. Buell (III.), Copperhill, Tenn.
With Tennessee Copper Company.
- T. Breckinridge Cabell (VI.), 516 W. Broadway, Louisville, Ky.
Electrician with H. I. Wood, Electrical Contractor.
- S. A. Caine (XIII.), 1077 Boylston Street, Boston, Mass.
Graduate Student, M. I. T.
- F. M. Carhart (I.), 231 So. Cleveland Avenue, Pocatello, Ida.
Instrument Man with Oregon Short Line R.R.
- Francis I. Chesterman (VI.), 26 Shurtleff Street, Chelsea, Mass.
Engineering Department, American Telegraph & Telephone Co.
- Robert Keep Clark (II.), 460 Dearborn Avenue, Chicago, Ill.
With George M. Clark & Co., Manufacturers Gas, Gasoline, and Coal
Stoves.
- W. D. Clarke (I.), Eureka, Cal.
Assistant Engineer, Oregon & Eureka R.R.
- Sidney L. Cole (II.), Niagara Falls, South Ontario, Can.
With Ontario Power Company.
- Leonard W. Cronkhite (IV.), Worcester College, Oxford, England.
Rhodes Student.
- Joseph Daniels (III.), Glace Bay, N.S.
Engineer, Dominion Coal Company, Ltd.
- L. J. T. Décary (IV.), Quebec, Canada.
Architect, with Mr. Guy Lowell.
- Emmit Dwyer (II.), 692 Jefferson Avenue, Detroit, Mich.
With Michigan Stove Company.
- Thomas W. Estabrook (V.), South Glens Falls, N.Y.
Assistant Superintendent, Finch, Pruyn & Co.
- Arthur E. Freeman (II.), 24 Summer Street, Claremont, N.H.
With Sullivan Machine Company.
- Harry R. Gabriel (I.), Seward, Alaska, care Alaska Central R.R.
Resident Engineer, Ninth Residency, Alaska Central R.R.
- Percy A. Goodale, Sp., 10 Post-office Square, Boston.
Agency Superintendent, Preferred American Insurance Company, in-
surance of all kinds.
- Arthur N. Hastings (IX.), 26 Dana Street, Cambridge, Mass.
Clerk with Central Trust Company, Cambridge.
- Daniel Hine (XIII.), 54 Vernon Street, Hartford, Conn.

- Carl T. Humphrey (I.), 431 Middle Street, East Weymouth, Mass.
Assistant at M. I. T.
- T. Edward Jewett (I.), care Ferro-Concrete Construction Company, Cincinnati, Ohio.
With Ferro-Concrete Construction Company.
- Alfred H. Kelling (V.), 710 North 8th Street, East St. Louis, Ill.
Chemist with N. Morris & Co.
- Louis J. Killion (I.), 1238 Allegheny Avenue, Philadelphia, Pa.
Draughtsman with Lewis F. Shoemaker & Co.
- Edwin M. Lines (VI.), 603 Hampton Avenue, Wilkinsburg, Pa.
Apprentice with Westinghouse Electric and Manufacturing Company.
- John H. McManus (I.), 2 Winter Street, Dorchester.
Assistant in Civil Engineering Department at M. I. T.
- Alden Merrill (V.), 16 Tremlett Street, Dorchester, Mass.
Student at Tech.
- Edward F. Moody (V.), Technology Chambers, Boston.
Chemist with the Simplex Electrical Company.
- Theodore P. Moorehead (I.), care Ferro-Concrete Construction Company, 430 Culvert Street, Cincinnati, Ohio.
With Ferro-Concrete Construction Company.
- Ilias A. Murr (I.), 370 W. Church Street, Elmira, N.Y.
Draughtsman, American Bridge Company.
- Victor H. Paquet (XIII.), 89 Union Street, Bath, Me.
In Engineering Department, Bath Iron Works.
- Charles R. Prichard (II.), 40 Nahant Street, Lynn, Mass.
With Beverly Gas and Electric Company.
- Paul J. Ralph (XIII.), 1032 Girard Avenue, Philadelphia, Pa.
Ship fitter with William Cramp & Sons, S. & E. B. Co.
- N. A. Richards (IV.), 362 Front Street, Weymouth, Mass.
Draughtsman with Purdy & Henderson, Boston, Mass.
- A. B. Russell (XIII.), 2 Franklin Street, Medford, Mass.
Draughtsman with Horton & Hemenway.
- R. W. Senger (III.), 323 Quincy Street, Pueblo, Col.
In Open Hearth Department, Colorado Fuel and Iron Company.
- Wilham F. Smart (II.), Technology Chambers, Boston.
With H. P. Converse & Co., 120 Milk Street, Boston.
- Arthur E. Spencer (III.), Foxboro, Mass.
Transitman, Boston & Providence Electric Railway.

Alfred E. Tadgell (VI.), 8 Rowland Street, Marblehead, Mass.

Clerk with Bay State Trust Company, Boston, Mass.

Married Grace A. Dow March 8, 1904. Child born December 20, 1904.

J. W. Taylor (II.), 4412 Winton Road, Cincinnati, Ohio.

With Proctor & Gamble Co.

C. E. Warren (II.), M. I. T., Boston.

Student.

Edward W. Washburn (V.), M. I. T., Boston.

Research Assistant.

H. L. Whitney (I.), Beverly, Mass.

Resident Engineer, city of Beverly.

Married Tuesday, Nov. 28, 1905, at Natick, to Eleanor D. Whitney.

Russell Willson (I.), United States Naval Academy, Annapolis, Md.

Midshipman, United States Navy.

Louis C. Winship (VI.), 408 Whitney Avenue, Wilkinsburg, Pa.

Apprentice, Westinghouse Electric and Manufacturing Company.

Robert Libbey Young (V.), Hotel Prescott, East Pepperell, Mass.

Chemist with Champion International Paper Company.

Elmer W. Wiggins (V.).

With A. D. Little, Consulting Chemist.